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BRITISH ISLANDS PILOT  
VOL. IV



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H. O. No. 147

# BRITISH ISLANDS PILOT

Volume IV

THE WESTERN COAST OF SCOTLAND FROM  
MULL OF GALLOWAY TO RUDH' RE  
AND OFF-LYING ISLANDS

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SECOND EDITION

1925

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<sup>U.S.</sup>  
PUBLISHED BY THE HYDROGRAPHIC OFFICE  
UNDER THE AUTHORITY OF THE  
SECRETARY OF THE NAVY



PRICE, 90 CENTS

WASHINGTON  
GOVERNMENT PRINTING OFFICE

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SUPPLEMENTARY NOTICE TO MARINERS CORRECTION SHEET FOR

H. O. PUB. 147

From N. M. 2, 1944 to N. M. 20, May 13, 1944

(151) SCOTLAND—West coast—Skerryvore—Information about shoal westward.—A shoal over which there is a depth of  $6\frac{1}{2}$  fathoms exists 8.71 miles  $277^{\circ}15'$  from Skerryvore Light. The 8-fathom sounding charted close northeastward of the above position will be expunged from the charts together with the note "Unexamined (1942)."

Approx. position:  $56^{\circ}20'24''$  N.,  $7^{\circ}22'24''$  W.

(Supersedes N. M. 29 (2232) of 1942.)

(N. M. 2, 1944.)

H. O. Pub. 147, 1925, page 266.

(153) SCOTLAND—West coast—Muck Island—Information about bank westward.—A depth of  $5\frac{1}{4}$  fathoms exists 7.52 miles  $359^{\circ}45'$  from Suil Ghorm Light. The 10-fathom sounding charted close southeastward of the above position will be expunged from the charts together with note "Unexamined (1941)."

Approx. position:  $56^{\circ}49'59''$  N.,  $6^{\circ}26'40''$  W.

(Supersedes N. M. 6 (429) of 1942.)

(N. M. 2, 1944.)

H. O. Pub. 147, 1925, page 305.

(674) SCOTLAND—West coast—Loch Scridain approach—Information about shoals.—A shoal over which the depth is 7 fathoms is located 1.85 miles  $250^{\circ}$  from the summit of Erisgeir. The 5-fathom shoal (P. A.) charted close south-southeastward of the above position will be expunged from the charts.

Approx. position:  $56^{\circ}24'$  N.,  $6^{\circ}18'$  W.

(N. M. 8, 1944.)

H. O. Pub. 147, 1925, page 256.

(958) SCOTLAND—West coast—Sound of Mull—Measured distance established.—A measured distance has been established on the western side of the Sound of Mull. The range beacons are located as follows: distances and bearings from Caisteal nan Con (Ruins) in (approximately)  $56^{\circ}34'$  N.,  $5^{\circ}56'$  W.:

(a) Northwest front beacon 1.75 miles  $282^{\circ}$ .

(b) Northwest rear beacon 1.78 miles  $281^{\circ}$ .

(c) Southeast front beacon 1.46 miles  $245^{\circ}30'$ .

(d) Southeast rear beacon 1.5 miles  $245^{\circ}$ .

A dashed line will be inserted from (b) above in a  $52^{\circ}$  direction for 620 yards to position (e). A dashed line will also be inserted from (d) above in a  $52^{\circ}$  direction for 1,220 yards to position (f). Positions (e) and (f) will be joined by a dashed line and the note "*Measured Distance 6,081 feet  $322^{\circ}$* " inserted along this line.

(N. M. 11, Mar. 11, 1944.)

H. O. Pub. 147, 1925, page 277.







(957) **SCOTLAND—West coast—Sound of Mull—Eilean Rudha an Rìdhe—Light established.**—A *flashing white* light every *second* has been established on the southwestern end of the southern Eilean Rudha and Rìdhe, about 1,180 yards 61° from Glas Eileanan Light. The light is exhibited 19 feet above the water.

Approx. position: 56°30' N., 5°42' W.

(N. M. 11, Mar. 11, 1944.)

H. O. Pub. 147, 1925, page 281.

(1121) **SCOTLAND—West coast—Firth of Lorne approach—Shoal depth.**—A depth of 11 fathoms exists about 7.5 miles 80°30' from Dubh Artach Light (56°08' N., 6°38' W.). The above depth will be surrounded by a 20-fathom curve which will be extended about one mile to the northward.

(N. M. 13, Mar. 25, 1944.)

H. O. Pub. 147, 1925, page 187.

(1530) **SCOTLAND—West coast—Firth of Clyde—Kyles of Butes—Information about lighted buoys.**—1. Lighted buoy No. 42, in (approximately) 55°55'50" N., 5°10'20" W., has been replaced by a conical lighted buoy which is painted red and shows a *flashing red* light.

Note.—The above number will not be shown against the new buoy.

2. The lighted buoy in (approximately) 55°55'51" N., 5°10'30" W., close westward of Eilean Buidhe, has been replaced by a lighted can buoy which is painted black and shows a *flashing white* light.

3. A lighted conical buoy, painted red and showing a *flashing white* light, has been established 580 yards 281° from the beacon off the southern extremity of Eilean Buidhe.

(N. M. 17, Apr. 22, 1944.)

H. O. Pub. 147, 1925, page 112.

(1532) **SCOTLAND—West coast—Lynn of Lorne—Rock.**—A submerged rock exists 2,970 feet 219° from Branra Rock Beacon.

Approx. position: 56°31'38" N., 5°27'07" W.

(N. M. 17, Apr. 22, 1944.)

H. O. Pub. 147, 1925, page 216.

(1829) **SCOTLAND—West coast—Firth of Clyde—Kilbrannan Sound—Lightship established.**—Clyde Lightship, painted red with a light tower amidships and showing a *group flashing red* light with 2 *flashes* every 30 *seconds*, flash 1 *second*, eclipse 5 *seconds*, flash 1 *second*, eclipse 23 *seconds*, has been established in 55°10'00" N., 5°22'00" W. The light is exhibited 40 feet above the water and is visible 11 miles.

The lightship is provided with a fog siren which sounds 2 *blasts* in quick succession every 90 *seconds*. The duration of each blast is 2 *seconds*.

The following cautionary note will be inserted on the charts:

"In the vicinity of Clyde Light Vessel strong tidal streams set in a north-westerly and southeasterly direction across the entrance to the Firth of Clyde."

(N. M. 20, May 13, 1944.)

H. O. Pub. 147, 1925, page 65.

225-26

H. O. No. 147

A Supplement containing information received in the Hydrographic Office from the date of publication of this book to December 31, 1925, will be issued in the early part of 1926, and will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

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H. O. No. 147

A Supplement containing information received in the Hydrographic Office from the date of publication of this book to December 31, 1930, will be issued in the early part of 1931, and will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

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H. O. No. 147

A Supplement containing information received in the Hydrographic Office from the date of publication of this book to December 31, 1931, will be issued in the early part of 1932, and will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

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H. O. No. 147

A Supplement containing information received in the Hydrographic Office from the date of publication of this book to December 31, 1932, will be issued in the early part of 1933, and will be sent free of expense upon the receipt of this coupon at the United States Hydrographic Office, Washington, D. C.

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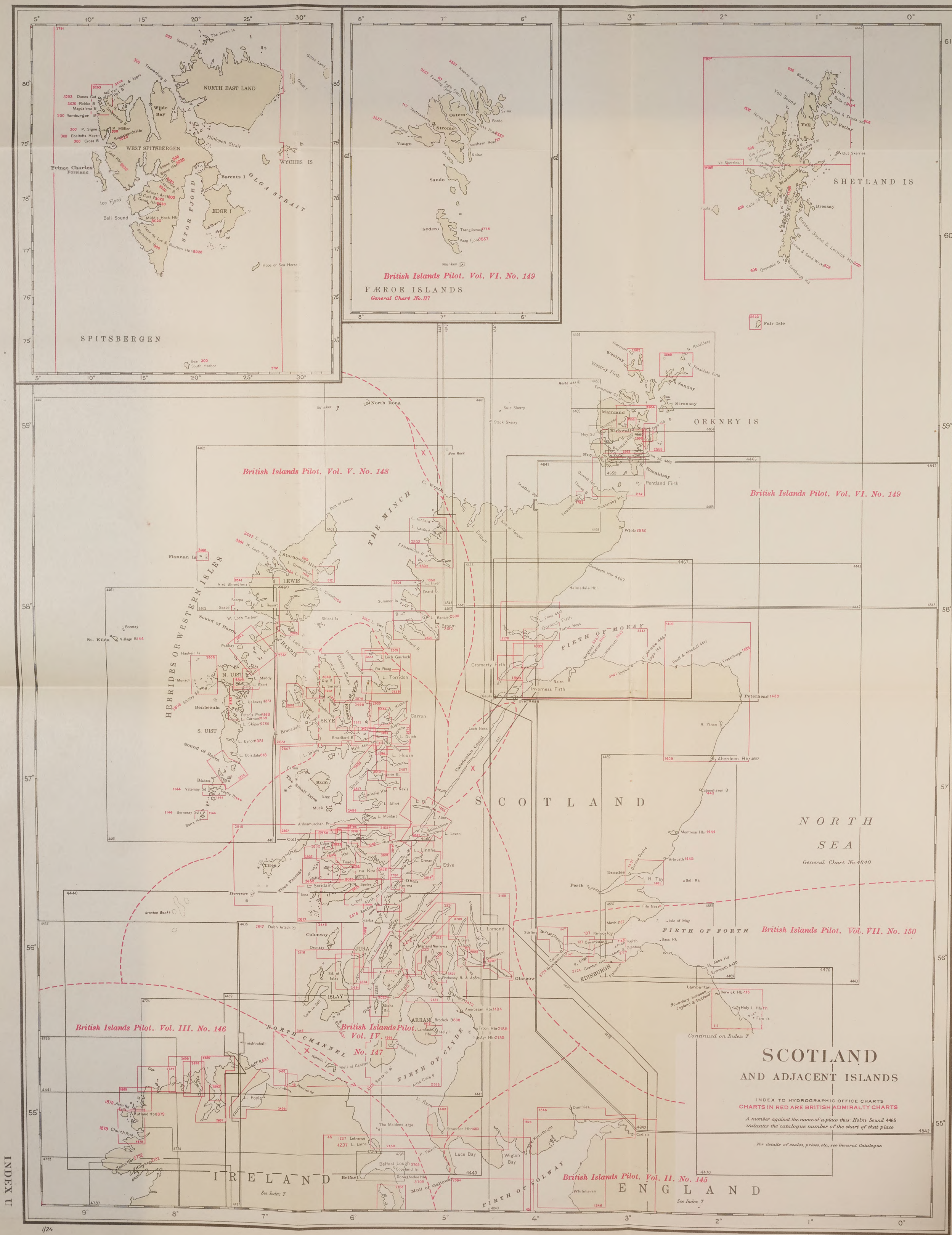
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SPITSBERGEN

British Islands Pilot. Vol. VI. No. 149  
FEROE ISLANDS  
General Chart No. 117

SHETLAND IS

Fair Isle

ORKNEY IS

British Islands Pilot. Vol. VI. No. 149

British Islands Pilot. Vol. V. No. 148

SCOTLAND

NORTH  
SEA  
General Chart No. 4840

British Islands Pilot. Vol. VII. No. 150

British Islands Pilot. Vol. III. No. 146

British Islands Pilot. Vol. IV. No. 147

SCOTLAND  
AND ADJACENT ISLANDS

INDEX TO HYDROGRAPHIC OFFICE CHARTS

CHARTS IN RED ARE BRITISH ADMIRALTY CHARTS

A number against the name of a place thus: Holm Sound 4465

indicates the catalogue number of the chart of that place

For details of scales, prices, etc., see General Catalogue

British Islands Pilot. Vol. II. No. 145

ENGLAND

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## P R E F A C E

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This publication is a revision of the first edition of H. O. Publication No. 147, British Islands Pilot, Volume IV, with corrections and additions from available sources to June 20, 1925, including corrections from Notice to Mariners No. 25 of 1925.

The bearings and courses are true, in degrees from  $0^{\circ}$  (north) to  $360^{\circ}$ , measured clockwise.

Bearings limiting sectors of a light are toward the light.

The directions of winds refer to the points from which they blow; of currents, the points toward which they set. These directions are true.

Variation of the compass, with the annual rate of change, may be obtained by consulting H. O. Chart No. 2406.

The geographical positions which are given at intervals throughout the book are approximate only and are intended to facilitate reference to the charts.

Distances are expressed in nautical miles, the mile being approximately 2,000 yards.

Distances less than a mile are expressed in fractions of a mile or in yards.

Soundings are referred to the datum of the H. O. Charts (see page 9), and are expressed in fathoms or feet followed by the equivalent in meters.

Heights are referred to high-water spring tides and are expressed in feet followed by the equivalent in meters.

The metric conversions are given in every case to the nearest tenth meter.

For details of lights, light vessels, fog signals, submarine bells, and light buoys, mariners should consult the Light Lists, as such lists are published annually, while Sailing Directions can usually only be republished once in a number of years.

Masters of vessels should keep complete files of weekly Notices to Mariners and supply themselves with the latest Lists of Lights and seek from local authorities, pilots, and harbor masters, the latest information relative to any special regulations in force in the particular locality visited.

Supplements to each volume of Sailing Directions are issued annually in a form convenient for cutting and inserting in the books on

the pages affected. They include all important information from reliable sources received in the Hydrographic Office since the publication of the latest editions of the Sailing Directions. The information contained in each supplement should be embodied in the volume affected and will bring it up to date.

Mariners are requested to notify the United States Hydrographic Office, Washington, D. C., or one of its branch offices, of errors they may discover in this publication or of additional matter which they think should be inserted.

## GLOSSARY OF GAELIC WORDS IN GENERAL USE

Gaelic	Approximate pronunciation	English Meaning	Gaelic	Approximate pronunciation	English Meaning
Abhuinn.....	Aven.....	River.	Ear.....	Er.....	East.
Aird.....	Ard.....	High point.	Eilean.....	Eilan.....	Island.
Airidh.....	Eri.....	A shealing.	Garbh.....	Garv.....	Rough.
Allt.....	Alt.....	Stream or brook.	Glas.....	Glas.....	Green or gray.
Bagh.....	Bè.....	Bay.	Gob.....	Gob.....	Bill or beak of bird.
Ban.....	Ban.....	White.	Gorm.....	Gorm.....	Blue.
Barr.....	Bar.....	Summit.	Iar.....	Iar.....	West.
Beag.....	Beg.....	Little.	Innis or Inch.....	En-nish.....	Choice pasture island.
Bealach.....	Biallakh.....	A pass or a gap.	Leac.....	Lekh.....	Slate or slab.
Beinn.....	Ben.....	Mountain.	Liath.....	Lia.....	Grey or blue.
Bogha.....	Boha.....	A sunken rock.	Linne.....	Linne.....	Gulf or lake.
Breac.....	Brek.....	Speckled.	Maol.....	Meal.....	Headland.
Buidhe.....	Bhui.....	Yellow.	Meall.....	Meal.....	Lump.
Bun.....	Bun.....	Foot, mouth of River.	Mointeach.....	Moentakh.....	Moss or moor land.
Camus.....	Kamus.....	Bay or creek.	Mor.....	More.....	Great.
Caolas.....	Kaolas.....	A firth or strait.	Ob.....	Ob.....	Creek or haven.
Ceann.....	Kian.....	Head.	Poll or Puill.....	Pol.....	Pool or bay, also bog.
Clach.....	Klakh.....	Stone.	Ruadh.....	Ruah.....	Red.
Cleit.....	Klet.....	A rugged eminence.	Rudha.....	Rua.....	A point of land.
Cnoc.....	Nok.....	Hill or knoll.	Salann.....	Salen.....	Salt water bay.
Creag.....	Krag.....	Cliff.	Sgeir.....	Ske-ir.....	A rock in the sea.
Crois.....	Krosk.....	Cross.	Sgor.....	Skuor.....	A peak.
Cruach.....	Kruakh.....	A heap.	Sron.....	Sron.....	Nose, promontory.
Dearg.....	Diarg.....	Red.	Stach.....	Stakh.....	A steep rock or conical hill.
Deas.....	Di-as.....	South.	Torr.....	Tor.....	A conical hill.
Druim.....	Drium.....	A ridge.	Traigh.....	Tre-i.....	Strand or sand beach
Dubh.....	Du.....	Black.	Tuath.....	Tu-a.....	North.
Dun.....	Dun.....	Mound, fort.	Uamh.....	Ua.....	Cave.
Each.....	Eakh.....	Horse.			

NOTE.—In the pronunciation of Gaelic dh and gh at the end of syllables are very frequently silent; bh is frequently pronounced as v.



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# INFORMATION RELATING TO NAVIGATIONAL AIDS AND GENERAL NAVIGATION

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## THE CORRECTION OF CHARTS, LIGHT LISTS, AND SAILING DIRECTIONS

**The Hydrographic Office** exists for the improvement of the means for navigating safely the vessels of the United States Navy and of the merchantile marine by providing accurate and cheap nautical charts, sailing directions, navigators, and manuals of instruction for the use of all vessels of the United States, and for the benefit and use of navigators generally.

The publications of the Hydrographic Office for the use of mariners are: Charts; Sailing Directions; Light Lists; Notices to Mariners; Hydrographic Bulletin; Daily Memorandum; Mine Warnings to Mariners; Pilot Charts; American Practical Navigator; Useful Tables from the American Practical Navigator; Star Identification Tables; Azimuth Tables; Azimuths of Celestial Bodies; Arctic Azimuth Tables; Altitude, Azimuth, and Line of Position; Simultaneous Altitudes and Azimuths of Celestial Bodies; Noon Interval Tables; The Sumner Line of Position; International Code of Signals; Development of Great Circle Sailing; and Tables of Distances. (See General Catalogue.)

**Sailing Directions or Pilots** are books treating of certain divisions of the navigable waters of the globe. They contain descriptions of coast lines and harbors; dangers; information of winds, currents, and tides; directions for approaching and entering harbors; and much other information of interest to mariners that can not be shown on charts or is not given in other Hydrographic Office publications.

The Sailing Directions are corrected, so far as practicable, to the date of issue from the office; subsequently the mariner should avail himself of the annual supplements which will be mailed on receipt of the proper coupon included for that purpose in the front of each volume. The more important corrections for the current year are published in the Notice to Mariners and should be inserted on the proper page of the volume of Sailing Directions affected.

The Hydrographic Office publishes 2 volumes of Sailing Directions of the Great Lakes of North America and 56 volumes that

include the remainder of the world except the coasts of the United States and its possessions, which are covered by Pilots published by the United States Coast and Geodetic Survey and issued by the Hydrographic Office to vessels of the United States Navy only.

**Light Lists** give detailed information of the position and character of lights, with a brief description of the lighthouses and of any accompanying fog signals. These publications, consisting of six volumes, revised annually, contain the latest available information of the lights of the world, except those of the United States and its possessions, and should always be consulted when information of lights is desired. They should be kept corrected to date by inserting at the appropriate places corrections published in Notices to Mariners.

In addition, these publications contain information of the uniform time system and visual time signals.

Similar publications giving full information of lights of the United States and its possessions are published by United States Coast and Geodetic Survey and are issued by the Hydrographic Office to vessels of the United States Navy only.

**Azimuth Tables**, Hydrographic Office Publication No. 71, contains tables giving the "true bearings" of the sun at intervals of 10 minutes between sunrise and sunset between  $71^{\circ}$  N. and  $71^{\circ}$  S. This table can be applied to the moon, planets, and stars when their declinations do not exceed  $23^{\circ}$  N. or S.

**The Azimuths of Celestial Bodies**, Hydrographic Office Publication No. 120, contains tables giving the "true bearings" of celestial bodies whose declinations range from  $24^{\circ}$  to  $70^{\circ}$  for parallels of latitude extending to  $70^{\circ}$  from the Equator; these tables are a continuation of the tables given in the Azimuth of the Sun, and the two books together will furnish the azimuth of any body whose declination does not exceed  $70^{\circ}$ .

**Arctic Azimuth Tables**, Hydrographic Office Publication No. 66, gives true bearings of the sun and other celestial bodies ranging in declination from  $0^{\circ}$  to  $23^{\circ}$  of the same name as the latitude for parallels of latitude from  $70^{\circ}$  to  $88^{\circ}$ , both inclusive. The true bearings are given at intervals of 10 minutes for 6 hours out of the 24; that is (in the case of the sun), from 5 a. m. to 8 a. m. and from 4 p. m. to 7 p. m. The tables are applicable in both the Northern and Southern Hemispheres.

**Altitude, Azimuths, and Line of Position**, Hydrographic Office Publication No. 200, contains the tables necessary for working a sight of a heavenly body for a line of position, using the cosine-haversine formula and Aquino's Altitude and Azimuth Tables. In addition, it contains tables for the corrections to be applied to ob-

served altitudes of the sun, moon, stars, or planets, so that a mariner supplied with this book and a Nautical Almanac is equipped to work a sight and plot a line of position by either method.

**Simultaneous Altitudes and Azimuths of Celestial Bodies**, Hydrographic Office Publication No. 201, contains tables by which the altitude and azimuth of a celestial body may be obtained by inspection and interpolation, thus making computation unnecessary. The limits of the tables provide for bodies whose declinations do not exceed  $24^{\circ}$  and places whose latitudes do not exceed  $60^{\circ}$ .

**Noon Interval Tables**, Hydrographic Office Publication No. 202, affords a means of finding without computation the interval to noon from the morning time sight. They are useful in ascertaining the vessel's run to noon and the local apparent time of noon.

**The Sumner Line of Position**, Hydrographic Office Publication No. 203, contains tables by which the hour angle and azimuth of a celestial body may be obtained by inspection and interpolation to readily lay down the Sumner line. They are arranged for use in the zone between latitude  $60^{\circ}$  N. and  $60^{\circ}$  S. employing the celestial bodies whose declinations do not exceed  $27^{\circ}$ . They are also available for use in the zone between latitude  $27^{\circ}$  N. and  $27^{\circ}$  S. for bodies whose declinations do not exceed  $60^{\circ}$ .

**Star Identification Tables**, Hydrographic Office Publication No. 127, gives the simultaneous values of declination and hour angle for values of latitude, altitude, and azimuth ranging from  $0^{\circ}$  to  $80^{\circ}$  in latitude and altitude and  $0^{\circ}$  to  $180^{\circ}$  in azimuth. These tables enable the navigator, knowing the approximate position of the vessel, to identify stars of the first magnitude by observing their bearing and altitude.

**Table of Distances**, Hydrographic Office Publication No. 117, gives the shortest navigable distances between ports. Where more than one route exists, the name of and distance over the most practicable one is given. Due to the factor of safety used by the Hydrographic Office in clearing dangers and changing courses, the distances given in this book may differ by a few miles from those obtained by different computations.

**American Practical Navigator**, Hydrographic Office Publication No. 9 (Bowditch), is a complete treatise on navigation, including the tables necessary in navigation, with directions for their use. It includes chapters on kindred subjects such as tides, marine surveying, winds, and ice. For the convenience of navigators, the tables are reproduced in a separate and less bulky volume called "Useful Tables from the American Practical Navigator."

**The Development of Great Circle Sailing**, Hydrographic Office Publication No. 90, is an exposition of the principles relating to great



circle sailing and their practical application as developed by certain cartographers in great circle charts.

**International Code of Signals**, Hydrographic Office Publication No. 87, describes the methods used in the International Code and is divided into three parts. Part 1 contains urgent and important signals and all the tables of money, weights, barometric heights, etc., together with a geographical list and a table of phrases formed with the auxiliary verbs.

The second part is a signal index. It consists of a general vocabulary and a geographical index, arranged alphabetically.

The third part gives lists of the storm warning, Coast Guard time signal, radio, and radio time signal stations of the United States, and of Lloyd's signal stations of the world.

It also contains semaphore and distant signal codes, the United States Army and Navy Dot and Dash, and Semaphore Codes, and the Morse Wigwag Code.

**Notices to Mariners**, containing newly acquired information relating to various parts of the world, are published weekly and mailed to all United States vessels in commission, branch Hydrographic Offices and agencies, and United States consulates. Copies are furnished free by the Hydrographic Office or by any of its branch offices on application.

The Hydrographic Office undertakes by means of the Notice to furnish to navigators all essential corrections to publications which it has issued or sold.

With each Notice there is also furnished to naval vessels a separate sheet giving the items relative to lights contained in the latest Notice and necessary to correct the Light Lists.

**Pilot Charts** of the North Atlantic, Central American Waters, and North Pacific and Indian Oceans are issued each month and of the South Atlantic and South Pacific Oceans each quarter. These charts give in graphic form available facts or conclusions from hydrography, navigation, and meteorology that will assist the mariner to choose the safest and quickest routes. Besides timely information of a varied nature, their principal features are: Average winds, currents, barometer, and percentage of gales, calms, and fog; presence of ice and derelicts; radiocompass and other signal stations; lines of equal variation of the compass for each degree and their annual change; and routes for steamers and sailing vessels. They are furnished in exchange for marine data or observations.

**Hydrographic Bulletin**, a weekly publication which supplements the Pilot Charts with late reports of ice, derelicts, important aids to navigation, and miscellaneous facts of use and interest to navigators. It is accompanied by a chartlet which shows the North Atlantic

Lane Routes and recently reported ice in the North Atlantic. The Bulletin contains information of all oceans and of the Great Lakes. It may be obtained free upon application.

**Daily Memorandum**, a daily publication which carries a synopsis of all important information relating to dangers and aids to navigation, including reports of ice, derelicts, etc., received up to 4 p. m. of the day of issue. It is circulated chiefly to the branch Hydrographic Offices. Its most urgent reports are broadcast by radio.

**Mine Warnings to Mariners** are issued from time to time regarding mine fields and routes through or near them in recent war zones. They are based on information obtained from the International Mine Clearance Committee at London. They are often supplemented by chartlets. When these mine fields are entirely swept the Mine Warnings will be discontinued.

### CHARTS

Charts are representations of land and water on a flat surface, prepared for the use of mariners.

On account of the curvature of the earth it is impossible to give an accurate representation on a flat surface, and this has led chart constructors to use various projections, all being somewhat distorted, but sufficiently accurate for the purpose of navigation.

The projections most used by chart constructors are the Mercator, the polyconic, and the gnomonic or great circle. Each projection has certain properties which adapt it to particular uses.

**Mercator charts** are the most convenient for navigational purposes. On a Mercator chart the shapes of small areas are but little distorted: latitudes and longitudes can be plotted easily and accurately; the vessel's track is a straight line and the angle this line makes with any meridian is the course.

However, the observed bearings are not identical with those laid down upon a Mercator chart, except the bearings north and south and east and west on the Equator, for the line of sight, except as affected by refraction, is a straight line and lies in the plane of the great circle, while the straight line on the chart, except the meridian line, represents not the arc of a great circle but the loxodromic curve, or rhumb line, which on the globe is a spiral approaching but never in theory reaching the pole. This difference is not appreciable with near objects and in ordinary navigation, but in high latitudes the bearings of distant objects, especially those lying nearly east or west, must be corrected for the convergence of the meridians before they can be used on a Mercator chart; consequently, Mercator charts are rarely used in polar regions.

**Polyconic charts** have practically no distortion along the middle meridian, are well adapted to all latitudes, represent the areas of regions correctly, and permit a single scale of distances.

The meridians and parallels on polyconic charts are curved, the rhumb line is curved, and there is slight distortion as the longitude departs from the middle meridian.

**Gnomonic, or great circle, charts** are useful for obtaining the great circle course and distance and for navigating in high latitudes where the Mercator projection fails. In this projection great circles appear as straight lines. There is distortion on these charts at points some distance from the point of tangency of the plane of projection and on them the rhumb line is curved.

**The polar chart**, a special form of the great circle projection designed for use in the polar regions, is so constructed that the rhumb line is spiral.

**The accuracy** of any chart depends upon the character and the thoroughness of the original survey and the completeness of the information received of subsequent changes. Hydrographic Office charts are based upon the most reliable surveys obtainable and are corrected from time to time from information received from reliable sources.

The sources and date of survey are given in the title, and the dates of extensive corrections and minor corrections are shown on the chart.

Many of the earlier surveys were incomplete and inaccurate and charts based only upon them carry the resulting errors, until later information or a resurvey furnishes the necessary corrections; so charts based on old surveys should be used with caution.

In general, it may be assumed that only surveys of well-frequented ports and their approaches have been complete and thorough enough to discover every danger.

Information in regard to remote places is always scanty, and sometimes entirely lacking; therefore, charts of these places can not always be kept up to date, and should be used accordingly.

In river deltas, particularly those with mud bottoms, the channels shift from time to time and the local authorities usually change the buoyage to correspond. It is difficult to keep charts of such places correct at all times.

**The number of soundings** on a chart is an indication of the completeness of the survey, but for the sake of clearness a chart is not expected to show every sounding taken. Sparse or unevenly distributed soundings indicate that the survey was not made in detail. Blank spaces among soundings indicate that no soundings were obtained, and it may generally be assumed when the near-by

or surrounding soundings are deep that in the banks the water is also deep; but among shallow soundings or near reefs all blank spaces must be regarded with suspicion.

A complete and detailed survey may fail to find every patch or pinnacle rock, particularly among coral regions, off rocky shores, and in water where rocks abound. A coast line can always be assumed foul unless it is shown to be clear.

**Fathom curves a caution.**—The necessities of navigation do not require and as yet have failed to provide detailed surveys of the general coasts, and on most charts the 5-fathom (9.1 m.) curve may be considered a danger curve inside of which it is not wise to venture unnecessarily.

On rocky shores or with deep-draft vessels it is well to regard the 10-fathom (18.3 m.) curve as such a danger curve.

A useful danger curve on well-surveyed coasts can be obtained by tracing with a colored pencil or ink the curve of depth next greater than the draft of the vessel using the chart; the edge of the sanding is a well marked danger line for vessels of less than 18 feet draft.

Charts of localities where soundings are scarce and the bottom uneven, so that curves of equal depths can not be drawn accurately or at all, should be used with caution.

Where an isolated sounding shows less water than surrounding depths, especially when marked with a dotted ring, it should be avoided, as the spot may not have been thoroughly examined or the least depth found.

**The chart on the largest scale** should always be used on account of its greater detail and the greater accuracy with which positions may be plotted on it. When approaching land or dangerous banks, the mariner should change from the small-scale chart to the chart on the largest scale in ample time to plot the best possible fix of the vessel.

**Notes on charts** should be read with care, as they may give important information that can not be graphically represented.

**Current arrows** on charts show only the most usual or the mean direction of a current; it must not be assumed that the direction of a current will not vary from that indicated by the arrow. The velocities of currents also vary with circumstances, and those given on the charts are merely the mean of those determined, possibly from very few observations.

**Compass roses on charts.**—The change in the variation from year to year gradually introduces an error in the magnetic compass roses on charts. In some localities there is a large annual change, and with a small-scale chart failure to correct a course or bearings

for this change will give an incorrect position. The date of the variation and the annual change are given on the compass rose; this information readily permits the conversion of magnetic courses and bearings into true, and facilitates the use of the true compass rose, which is the best practice.

In some parts of the world the variation changes so rapidly with a change of position that frequent changes of compass course are necessary to maintain a true course. For example, in approaching New York from Liverpool on the great-circle course, the variation changes over  $10^{\circ}$  in less than 600 miles.

**Local magnetic disturbance of the compass.**—Magnetic masses of minerals, external to a vessel, exert an effect on the compass known as "local magnetic disturbance" or "local attraction." Such disturbance of the compass in vessels at sea is sometimes experienced in different parts of the world. The adjacent land is probably not the cause of the disturbance, because the effect of a magnetic force decreases so rapidly with distance that it would require a local magnetic center of a force hitherto unknown to affect a vessel's compass even a short distance away. Magnetic minerals at the bottom of the sea under the vessel probably cause these deflections of the compass, perhaps with strong force in shallow water. The compass may be disturbed when steaming over such a spot, but the disturbance will only extend over a small space unless there are many magnetic centers close together.

**Distribution of charts.**—The Hydrographic Office prepares, issues to the United States Navy, and sells to mariners, direct or through its agents, Mercator charts for general navigation, a great-circle chart of each ocean, and a polar chart of the north polar region. To the United States Navy only it issues United States Coast and Geodetic Survey charts, some Mercator, some polyconic, of the coasts of the United States and its possessions, and such other charts, mainly those of the British Admiralty, as are necessary.

All charts issued by the Hydrographic Office are corrected to date of issue and stamped to that effect on the face of the chart.

The dates on which extensive corrections are made are noted on the chart on the right of the middle of the lower edge; those of the small corrections at the left lower corner.

The edition and corresponding date of the chart will be found in the lower right-hand corner outside of the outer neat line.

**The General Catalogue of Mariners' Charts and Books**, published by the Hydrographic Office, is issued to all naval vessels when commissioned and to all merchant vessels upon request.

The catalogue of charts issued by the Coast and Geodetic Survey is furnished to all naval vessels by the Hydrographic Office and

may be obtained by all other mariners directly from the Coast and Geodetic Survey.

**Tides.**—A knowledge of the times of high and low water and of the amount of vertical rise and fall of the tide is of great importance in the case of vessels entering or leaving port, especially when the low water is less than or near their draft. Such knowledge is also useful at times to vessels running close along a coast, in enabling them to anticipate the effect of the tidal currents in setting them on or off shore. This is especially important in fog or thick weather.

**Planes of reference.**—The plane of reference for soundings on Hydrographic Office charts made from United States Government surveys and on United States Coast and Geodetic Survey charts of the Atlantic coast of the United States is mean low water; on the United States Coast and Geodetic Survey charts of the Pacific coast of the United States, the Hawaiian Islands, the Philippines, and Alaska it is the mean of the lower low waters; on United States Hydrographic Office charts of the coast from Puget Sound to Alaska it is low-water ordinary springs.

The plane of reference for British Admiralty charts, based on British surveys, is, in waters where the daily inequality is small, the level of mean low water springs, and in places where the daily inequality is considerable the level of Indian spring low water, which is approximately the lowest possible low water, and therefore corresponds closely to the mean of the lower low waters at places having a large daily inequality.

The plane of reference for United States Hydrographic Office charts and for British Admiralty charts, based on charts of other nations, is that used by the original authority.

The plane of reference of Denmark, Norway, and Japan is mean low water springs, of Holland is mean low water, of Germany is a definite distance below mean low water springs, and of France and Spain is the lowest low water.

The plane of reference may be in doubt on charts compiled from old or various sources, and in such case, or whenever not stated on the chart, the assumption that the reference plane is mean low water and not low water ordinary springs gives a larger margin of safety. There are times when the tide may fall below any plane of reference that is used on the chart. Low water is lower than mean low water about half the time, and when a new or full moon occurs at perigee the low water is lower than the average low waters of springs. On the coast of Europe the spring range is increased at the equinoxes but in some other parts of the world, especially those places having a large daily inequality, such periodic low tides occur at the solstices.

The water may fall at times below even a very low plane of reference, owing to the wind or to a high barometer.

Much daily inequality in the tides of certain coasts causes the amount of rise and fall to be unreliable, and additional caution must be used; also the establishment for such places can not be considered reliable.

The International Hydrographic Conference of 1919 recommended for future consideration a uniform reference plane for all nations, to be called "International low water."

**Mean sea level.**—The depths at half tide are practically the same for all tides, whether neaps or springs. Half tide, therefore, corresponds with mean sea level. This makes a very exact plane of reference easily found, to which it would be well to refer all high and low waters.

If required to take special soundings for the chart at a place where there is no tidal bench mark, mean sea level should be found and the plane for reductions established at the proper distance below it, as ascertained by the Tide Tables or by observations, or, in some cases, if the time be short, by estimation, the data used being made a part of the record.

**Tidal currents.**—In navigating along coasts where the tidal range is considerable, special caution is necessary. It should be remembered that there are generally indrafts and corresponding outdrafts abreast of all large bays and bights, although the current may generally run nearly parallel with the shore outside of the entrances.

The turn of the tidal current offshore seldom coincides with the time of high and low water along the shore. In some channels the tidal current may overrun the turn of the vertical movement of the tide by three hours, so that at high and low water by the shore the current is running at its greatest velocity.

The effect of the tidal wave in causing currents may be illustrated by two cases:

1. Where there is a small tidal basin connected with the sea by a large opening.
2. Where there is a large tidal basin connected with the sea by a small opening.

In the first case, the velocity of the current in the opening will have its maximum value when the height of the tide within is changing most rapidly, i. e., at a time about midway between high and low water. The water in the basin keeps at approximately the same level as the water outside. The flood current corresponds with the rising and the ebb current with the falling of the tide.

In the second case, the velocity of the current in the opening will have its maximum value when it is high water or low water without,

for then there is the greatest head of water for producing motion. The flood current in such cases generally begins about three hours after low water and the ebb current about three hours after high water, slack water thus occurring about midway between the tides.

Along most shores not much affected by bays, tidal rivers, etc., the current usually turns soon after high water and low water.

The swiftest current in straight portions of tidal rivers is usually in the middle of the river, but in curved portions the most rapid current is toward the outer edge of the curve, and here the deepest water will generally be found. The pilot rule for best water is to follow the outer edge of the curves or the ebb tide reaches.

Countercurrents and eddies may occur near the shores of straits, especially in bights and near points. A knowledge of them is useful in order that they may be used or avoided.

A swift current often occurs in a narrow passage connecting two large bodies of water, owing to their considerable difference of level at the same instant. The several passages between Vineyard Sound and Buzzards Bay are cases in point.

Tide rips are generally made by a rapid current setting over an irregular bottom, as at the edges of banks where the change of depth is considerable, but they sometimes occur on the high seas.

**The General Tide Tables**, published annually by the United States Coast and Geodetic Survey, give the predicted times and heights of the high and low waters for every day in the year at 83 of the principal ports of the world, and from these, by means of tidal differences and ratios, at a very large number of subordinate ports. The tables for the Atlantic and the Pacific coast ports of the United States are also published separately. These tables predict the times of high and low water, and not the times of turning of the current or of slack water, which may be quite different.

The distinction between "rise" and "range" of the tide should be understood. The former expression refers to the height attained above the datum plane of sounding, differing with the different planes of reference; the latter, to the difference of level between successive high and low waters.

Full explanations and directions for using the General Tide Tables are given in that book.

**Aids to navigation—Lights.**—Charts and Light Lists give the visibility of lights for a height of 15 feet (4.6 m.) of the observer's eye, and the effect of a greater or less height of the observer's eye can be obtained by the tables of distances published in all of the Light Lists.

A light is sooner sighted aloft, as there the observer's range of vision is increased, and an approximate bearing of the light may be



obtained by noting while aloft a star, over or nearly over the light, and later observing the bearing of the star with the compass.

Powerful lights often loom far beyond the limit of visibility of the actual rays of the light, and this must not be confounded with the true range. Refraction also often causes a light to be seen farther than under normal conditions.

On first sighting a light, by at once lowering the eye several feet and nothing whether the light is made to dip, it may be determined whether the vessel is on the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

When expecting to sight a light in thick weather, its power and color should always be considered. Haze obscures a weak or a colored light and decreases the chance of sighting it.

The distance from a light can not be estimated either by its brilliance or by its dimness, but only by its change of bearing.

When a light is sighted it should be identified at once by checking its characteristics as given in the Light List, particularly when approaching a well-lighted coast, where lights with similar characteristics sometimes are found close together.

The power of a light can be estimated by its candlepower or order, as given in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range corresponding to its height. For example, a light elevated 120 feet (36.6 m.) above high water and only visible 9 miles in clear weather must be of small candlepower, for if of sufficient candlepower its height would give a visibility of over 16 miles.

**Buoys.**—Buoys do not always maintain exact positions; therefore they should always be regarded as warnings and not as fixed navigational marks, especially during the winter months or when moored in exposed waters. A vessel's position should, when possible, be plotted not by buoys, but by bearings or by angles of fixed objects on shore.

**Light buoys** can not always be relied on, because the light may become extinguished or, if periodic, the apparatus may fail to operate.

**Whistle and bell buoys** are sounded by the action of the sea; therefore in calm weather they are less effective and at times may not sound.

**Piloting**, in the modern sense of the word, is the art of conducting a vessel in channels and harbors and along coasts where landmarks and aids to navigation are available for fixing the position and where the depth of water and dangers to navigation require a constant watch and frequent changes of course. Piloting requires the greatest experience and nicest judgment of any form of navigation. An error in position on the high seas may be rectified by later

observations, but an error in position while piloting often results in disaster. Therefore the mariner should endeavor to be proficient in this important branch, mindful that a modern, well-found vessel is usually safe on the high seas, but in danger when approaching land and making harbor.

In planning to enter a strange port, the mariner should give careful previous study to the chart, sailing directions, and tide tables and should select the most suitable marks for use, providing substitutes in case those selected can not be recognized with absolute certainty. Ranges should be noted, if available, and the lines drawn on the charts both for leading through the deepest water in channels and for guarding against particular dangers: for the latter purpose safety bearings should in all cases be laid down when no suitable ranges offer. The courses to be steered in entering should be laid down and distances marked thereon.

If intending to use the sextant and danger angle in passing dangers, and especially in passing between dangers, the danger circle should be plotted and regular courses planned, rather than to run haphazard by the indications of the angle alone, with possible trouble from bad steering at critical points.

It should be remembered that channel buoys seen from a distance are difficult to identify, because their color is sometimes not easily distinguished, and they may appear equally distant from the observer, even when at widely varying distances.

The vessel's position should be fixed at all times, even when entering ports considered safe and easy of access, and should be constantly checked, using for the purpose those marks whose identity has been established beyond doubt.

The vessel should ordinarily steer exact courses and follow an exact line as planned from the chart, changing course at precise points, and, where the distance run on the same course is considerable, the position on the line should be checked at frequent intervals. This procedure is desirable even when it may seem unnecessary for safety, because if running by the eye alone, and the vessel's exact position be immediately required, as in a fog or sudden squall, a fix at that particular moment may be difficult to obtain.

This habit of running exact courses with precise changes of course will also be found most useful when it is desired to enter port or pass through inclosed waters by means of the buoys alone, as during a fog; here safety demands that the buoys be made successively, which requires, if the fog be dense, very accurate courses and careful attention to the speed of the vessel and the set of the current; failure to make a buoy when expected leaves, as a rule, no safe alternative but to anchor at once, with perhaps a consequent serious loss of time.

Changes of course should in general be made by exact amounts, naming the new course or the amount of the change desired, rather than by ordering the rudder to be put over and then steadying when on the desired course, with the danger of the attention being diverted, and of forgetting that the vessel is still swinging. The helmsman knowing what is desired and the amount of change to be made, is able to act more intelligently and to steer a good course, which is essential in narrow channels.

In passing between dangers where there are no suitable ranges, as, for instance, between two islands or an island and the main shore when the conformations of the shore line are very similar, with dangers extending from both, a mid-channel course may be steered by the eye alone with great accuracy, as the eye is able to estimate very closely the line that lies midway between.

In piloting among coral reefs or banks, a time should be chosen when the sun will be astern, conning the vessel from aloft or from an elevated position forward, for the line of demarcation between the deep water and the edges of the shoals is indicated with surprising clearness. This method is of frequent application in the numerous passages of the Florida Keys.

**Coast piloting** involves the same principles as piloting in a harbor or channel and similarly requires that the vessel's position be continuously determined as landmarks are passed.

The routes should be planned for normal condition of weather, with suitable variations in case of fog, or bad weather, or for making points at night.

On well-surveyed coasts there is a great advantage in coasting near the land, keeping the marks and the soundings, and thereby knowing at all times the vessel's position, rather than keeping offshore and losing the marks, with the necessity of again making the land from a doubtful position, with, perhaps the added inconvenience of fog or bad weather.

The danger circle for either the horizontal or the vertical danger angles should be plotted wherever the method can usefully be employed, and the angle should be marked on the chart. This practice will save many miles in rounding dangerous points, with no sacrifice of safety. Where available, ranges should also be marked on the chart, either to lead clear of dangers or to check the deviation of the compass.

In making a coastwise trip against a strong offshore or head wind it may be desirable, with trustworthy charts, to skirt the shore as closely as possible, in order to avoid the heavier seas and adverse currents that prevail farther out. In some cases, with small vessels, a passage can be made only in this way. The important saving of coal and of time thus effected by skillful coast piloting makes this

subject one of prime importance to the navigator. Many vessels attempting to save time or distance approach dangers too closely and get into trouble, so a mariner should always remember that the safety of the vessel is the first consideration.

In case of regular runs over the same route the courses and distances should be entered in a notebook and laid down on the chart, where they will be available for ready reference.

The officer of the watch should keep a continuous record of the progress of the vessel, entering in the navigator's notebook and ship's log book the time and patent log reading of all changes of course and the bearings of objects, especially when abeam. In this way reckoning is regularly kept without the presence or particular order of the captain or navigating officer. The fresh and exact position thus available is useful at all times, and is particularly valuable at night or in case of a sudden squall or fog.

**Fixing position.**—A navigator in sight of objects, which are recognizable and are shown on the chart, may fix his position by any of the following methods:

1. Sextant angles between three known objects.
2. Bearings of a known object and the angle between two known objects.
3. Cross bearings of two or more known objects.
4. Two bearings of a known object, separated by an interval of time, with the run during the interval.
5. Bearing and distance of a known object.

Besides the foregoing there are three methods by which, without obtaining the precise position, the navigator may assure himself that he is clear of any particular danger. They are—

1. By following a range.
2. By using the danger angle.
3. By using the danger bearing.

These various methods are fully explained in most textbooks on navigation and in the American Practical Navigator, a copy of which should be in the navigator's outfit.

The existing conditions will usually determine the method to be used, but where there is a choice the method that will assure the most accurate fix should be employed.

**Deep-sea navigation.**—At sea, the position of the vessel may be determined by "dead reckoning" or by observations of heavenly bodies. There are several methods used in obtaining the "dead reckoning" position and various formulas used to obtain position by observation. The American Practical Navigator gives full description of these methods and should be consulted by the mariner.

The method which should be thoroughly understood and regularly used is that employing position or Sumner lines. The formula of

Marcq. St. Hilaire offers a way to readily obtain at any time a line of position either by computation or by employing the Hydrographic Office Tables of Altitude and Azimuth.

Lines of position, however obtained, give the most comprehensive information to the navigator with the least expenditure of labor and time. After working a line of position and plotting it on the chart, the mariner knows the vessel must be somewhere on the line, provided the data used be accurate and the chronometer correct. As the information given by one line of position is not enough to determine the definite location of the vessel, it is necessary to cross this line by another similarly obtained, and the vessel being somewhere on each must be at their intersection.

A single line will at times furnish the mariner with valuable information; for instance, if it points toward the coast it marks the bearing of a definite point on the shore, or, if parallel to the coast, it clearly indicates the distance off, and so will often be found useful as a course. When the heavenly body is abeam, the line of position will be parallel to the vessel's course and will indicate whether the vessel is on the course, or the distance away from the course. When the heavenly body is ahead or astern, the line of position will be at right angles to the course and will indicate whether the vessel is ahead or astern of the position by "dead reckoning."

A sounding taken at the same time as the observation will, under certain conditions, prove of great value in giving an approximate position on the line.

**Crossing two lines.**—A very accurate position can be obtained by observing two or more stars at morning or evening twilight, at which time the horizon in clear weather is well defined. The position lines thus obtained will, if the bearings of the stars differ  $30^\circ$  or more, give an excellent fix. A star or planet at twilight and the sun afterwards or before may be combined; also two observations of the sun with sufficient interval to admit of a considerable change of bearing; in these cases one of the lines must be moved for the run of the vessel.

**Navigation in a fog.**—In spite of all aids to navigation, closing the land in a fog is attended with danger, and a mariner approaching the shore in a fog should first consider whether the necessity to continue is sufficiently great to justify the certain risk involved. In addition to the dangers of navigation, grave risk of collision exists in a fog, a discussion of which is not within the province of this book, but which must be duly considered by the mariner in deciding whether to enter a harbor or narrow waters during a fog. A mariner is often overtaken by a fog in narrow waters, under which circumstances there is no choice but to proceed.

If the urgent nature of the voyage justifies the attempt, or if circumstances force the vessel to continue, the mariner should proceed with caution, taking advantage of all aids to navigation.

**Taking soundings in a fog.**—Soundings at regular and frequent intervals should be taken, and the depths and the character of the bottom obtained. The depths should be placed on tracing paper on the same scale as the chart, and on the course steered by the vessel, and the tracing paper moved over the chart, keeping the line representing the vessel's track parallel with the course until the observed soundings and character of bottom agree or nearly agree with those given on the chart, which procedure will determine the ship's position fairly accurately. At least it will give a good indication of the position.

After entering a channel or fairway marked by buoys or other aids, endeavor to sight each buoy or aid in succession; and if unsuccessful, anchor, for in narrow waters it is usually unsafe to proceed after missing a buoy.

**Aids to navigation in a fog.**—Bell buoys, whistle buoys, fog-horns, either operated by compressed air or by hand, sirens, steam whistles, explosions (usually from a gun), all depend upon the transmission of sound through the air and are sometimes unreliable, because sound travels through the air in a variable manner. Apart from the influence of the wind and with no apparent reason, large zones of silence often occur at varying directions and different distances from the origin of a sound, so entire dependence can never be placed upon these fog signals.

The wind may throw the sound up or down, depending upon circumstances, so lookouts should be stationed aloft, on the bridge, and on deck.

A fog sometimes creeps imperceptibly shoreward, unobserved at first by the lightkeeper, while a vessel enveloped in the fog confidently approaches the land, depending upon a signal which is not being sounded.

**Echoes.**—In many inland passages, where the channels are narrow, or along certain coasts which are hilly and mountainous, such as occur in southeastern Alaska, it may prove useful in a fog to sound a whistle or siren and to estimate the distance offshore by the loudness or faintness of the echo as it reverberates from the sides of the hills or mountains.

**Submarine bells.**—Many light vessels are equipped with submarine bells, which are heard farther and with greater certainty than signals sounded in the air, and a vessel equipped with receiving apparatus may determine the approximate bearing of the signal. The chance of the keeper not sounding the signal exists in any system, however, and must be remembered. These signals may be

heard on vessels not equipped with receiving apparatus by observers listening at the skin of the ship below the water line, but the bearing of the signal can not be as readily determined.

Vessels equipped with radio and submarine bell receivers may fix their distance from a light vessel having radio and submarine bell by utilizing the difference in velocity of sound waves of the radio and the bell. Sound travels 4,794 feet per second at 66° F. in water, and the travel of radio sound waves for practicable distances may be taken as instantaneous.

**Radiocompass stations.**—The most recent and perhaps the most valuable aids to navigation in a fog are the radiocompass stations.

**Use in a fog.**—In approaching land during a fog the nearest radiocompass station should be requested to furnish bearings; usually there will be two or more stations available which will supply, through a control station, simultaneous bearings of the vessel from the different stations, which will enable the mariner to plot the vessel's position. These bearings can be furnished at frequent intervals and the position continuously checked. Under 50 miles no correction is necessary for the distortion from the true bearing inherent in a Mercator chart. All reports from mariners using these bearings indicate their accuracy within 2°, so they should always be used during a fog or poor visibility.

Where only one radiocompass station is available, the mariner may fix his position by two or more bearings from the station with the distance run between, or may use it as line of position, or as a danger bearing.

**Long-distance bearings.**—While radiocompass stations are primarily provided to assist the mariner in closing the land in fog or poor visibility, they may also be used to obtain the positions of vessels at sea in radio range when for any reason positions by observation can not be obtained. When more than 50 miles from the shore, to plot positions accurately it is simpler to use a chart on the gnomonic projection having a special compass rose for each station; if a Mercator chart is used, a correction must be applied to the bearings on account of the distortion inherent in a Mercator projection; the diagram on H. O. Chart No. 5193 will be found useful for obtaining this correction.

**Uniform system of time keeping at sea.**—A uniform system of time keeping at sea, as described hereafter, has been adopted by the navies of the principal maritime countries.

This system is intended to insure vessels at sea within certain defined limits of longitude keeping the same time in a manner similar to that now used on land. The ship's clock will therefore now be set to show the time of a definite hourly meridian, instead of being set to an indefinite time selected by the ship.

The surface of the globe is conceived to be divided into 24 staves or zones, each bounded by meridians  $15^{\circ}$  of arc or 1 hour of time apart in longitude. The initial zone is the one which has the meridian of Greenwich running through the middle of it, and the meridians  $7\frac{1}{2}^{\circ}$  east of Greenwich and  $7\frac{1}{2}^{\circ}$  west of Greenwich marking its eastern and western limits; it is called the zero zone because the difference between the standard time of this zone and Greenwich civil time is zero. And each of the zones in turn is designated by a number representing the number of hours by which the standard time of the zone differs from Greenwich civil time.

The zones lying in east longitude from the zero zone are numbered in sequence from 1 to 12, and are called minus zones, because, in each of them, the zone number must be subtracted from the standard time in order to obtain the Greenwich civil time. The zones lying in west longitude from the zero zone are likewise numbered in sequence from 1 to 12, and are called plus zones, because, in each of these zones, the zone number must be added to the standard time in order to obtain the Greenwich civil time.

The twelfth zone is divided medially by the one hundred and eightieth meridian (the line separating the meridians of east longitude from the meridians of west longitude), and the terms minus and plus are used in the halves of this zone which lie in east longitude and west longitude, respectively.

The number of a zone prefixed by the plus sign, thus, +, or by the minus sign, thus, —, constitutes the "zone description" of the time of that zone.

In the vicinity of the land the boundaries between zones are modified so as to be in accord with the boundaries of the countries or regions using corresponding times. In actual practice the boundaries of time zones on land are determined by the frontiers of countries, and agree generally with those at sea which are now defined by the meridians of  $7\frac{1}{2}^{\circ}$ ,  $22\frac{1}{2}^{\circ}$ , etc., except when modified as necessary by the territorial limits of the countries concerned.

A graphic representation of this system will be found on Chart 5192. "Time zone chart of the world," published by the Hydrographic Office.

**Use of oil for modifying the effects of breaking waves.**—Experience has proved the usefulness of oil in modifying the effect of breaking waves and has developed simple and effective methods of using it.

The principal facts developed to date are:

1. The heaviest and thickest oils, notably animal and vegetable oils, are the most effective. Crude petroleum is serviceable and should be used when no better oil is available; it may be improved by mixing with other oils. Refined kerosene is of little value.



2. In cold weather oils thicken and do not spread freely. This tendency to thicken may be reduced by thinning a heavy, sticky oil with petroleum.

3. A small quantity of oil suffices if it can be made to spread to windward.

4. Oil spreads very slowly, so a vessel with engines stopped or running slowly before a sea can make a slick to windward but not to leeward, except perhaps close alongside, for the vessel's drift or speed will exceed the rate of spread of the oil.

5. The effect of oil on free waves—that is, on waves in deep water—is greatest.

6. The effect of oil on a surf or waves breaking on a bar where a mass of shallow water is in actual motion is less than on free waves, but oil is of some service under these conditions.

7. A vessel at sea will get the best results by drifting or running slowly before the sea, and distributing oil either from canvas bags filled with oakum saturated with oil and slung over the side into the sea or from the waste pipes.

8. In crossing a bar in heavy weather oil in considerable quantities is needed on both sides of the vessel for a very short time. A convenient method in this situation is to trail a hose over the bow and pour oil freely through it. A funnel attached to the hose will facilitate the operation.

9. In crossing a bar with flood current pour oil overboard and allow the oil to float in ahead of the vessel. To an entering vessel crossing a bar with an ebb current oil is of little use.

10. Oil is useful to vessels and boats when running, or lying to, or in wearing.

11. A vessel riding to a sea anchor can fasten an oil bag to an endless line rove through a block on the sea anchor. This method distributes the oil ahead and provides a means to haul the bag aboard for refilling.

12. Before boarding a wreck have the wreck use oil freely on both sides, if able to do so. If the wreck can not use oil, rescuing vessel should first pass to leeward of the wreck, using oil freely to form a slick into which the wreck will drift.

If the wreck be aground, the attending circumstances will indicate the methods to be used.

13. In lowering or hoisting boats in heavy weather, in port or at sea, oil will greatly assist the operation.

14. In towing another vessel in a heavy sea oil should be distributed from the towing vessel forward and on both sides; if it is only distributed from the afterpart of the towing vessel, only the tow is benefited.

## CHAPTER I

### GENERAL REMARKS—COMMUNICATION—COAL—DRY DOCKS— BUOYAGE—SIGNALS—FISHING—ICE—APPROACHING LAND— VARIATION—SOUNDINGS—WINDS—WEATHER—TIDES—TIDAL CURRENTS

**General remarks.**—Scotland, the northern part of the island of Great Britain, lies between the parallels of  $54^{\circ} 38'$  and  $58^{\circ} 40'$  N. latitude, and the meridians of  $1^{\circ} 46'$  and  $6^{\circ} 14'$  W. longitude. Its greatest length, north-northeast and south-southwest, is 246 miles, and the breadth, which varies greatly, may be considered from 136 to 30 miles.

The southern part of Scotland, extending between Ayr and Galloway, in the west, and Berwickshire and Haddingtonshire, in the east, is a belt of high ground, known as the Southern Uplands. The mountains are flat-topped, with broad round shoulders and smooth grassy slopes, forming irregular groups. Mount Merrick, 2,764 feet (842.5 m.) high, situated 25 miles eastward from Corsewall Point, the northern end of the Rinns of Galloway, is the highest point.

The central plain, lying between the Southern Uplands and the Highlands, is a broad depression, diversified by several more or less abrupt and isolated hills.

The Highlands of Scotland lie northward of a line drawn from Helensburg, at the mouth of the Clyde, to Stonehaven, Kincardineshire, and are a mountainous tract built up largely of crystalline schists and granitic rocks. The mountains, which form irregular groups, are massive and generally flat-topped, while there is no great disparity of height among the summits of any individual group. The greatest height reached is 4,408 feet (1,343.6 m.) in Ben Nevis.

The Highlands are intersected from southwest to northeast by the Great Glen.

The west coast of Scotland presents an almost uninterrupted succession of deep indentations and bold rocky cliffs and headlands. A series of islands, known as the Hebrides or Western Islands, stretches almost uninterruptedly along and at short distances from the coast.

The Firth of Clyde separates the Isles of Arran and Bute from Ayrshire, and the counties of Argyll and Dumbarton from that of Renfrew. Arms of the seas to which the name of lochs has been

given, have penetrated the west coast far inland; the largest of these are Loch Long, at the head of the Firth of Clyde; Loch Fyne, wholly, and Loch Linnhe, chiefly in Argyllshire, the former celebrated for its herring fisheries, and the latter as the southwestern approach to the Caledonian canal; Lochs Carron, Torridon, and Gairloch in Rossshire.

The Hebrides Islands form two groups, viz, the Outer and the Inner Hebrides. The Outer Hebrides, extending from Barra Head to the Butt of Lewis, are described in H. O. Pub. No. 148. The Inner Hebrides include the Isles of Skye, Mull, Islay, Jura, Rum, Eigg, Coll, Tiree, and Colonsay, and numerous smaller isles. They are separated from the Outer Hebrides by the Sea of the Hebrides and the Minch, and shelter the channels between them and the coast of Scotland, so that it is possible to avoid the heavy Atlantic sea during gales for a considerable distance. In fact, for vessels able to go through the Crinan Canal, joining Loch Fyne to the Sound of Jura, smooth water may be secured from Glasgow nearly as far as Stornoway.

Owing to the sterile nature of the country of the Highlands and Inner Hebrides, it is sparsely inhabited, and devoted to the breeding of stock; whereas in the Lowlands, where coal, iron, and other minerals exist, there is a large population.

**Population.**—The population of Scotland was 4,882,288 in 1921.

**Rivers.**—The only river of any consequence on the west coast of Scotland is the Clyde, which has been converted by dredging from a shallow stream into a channel which has a depth of from 21 to 22½ feet (6.4 to 6.8 m.) at low water from the sea to Glasgow.

**Ports.**—The principal mercantile ports on the west coast of Scotland are almost all within the Firth of Clyde, and though to the northward of this firth the lochs form magnificent natural harbors, there is but little trade. In many cases the lochs are too deep for convenient anchorage, but, from the general rugged and mountainous nature of the country they afford some very fine scenery.

**Communications — Steam vessels.** — Communication is well maintained by steam vessels with all places of the slightest importance on the west coast of Scotland, as well as with the outlying islands. The principal starting points are Glasgow, Greenock, and Ardrossan, on the Clyde; West Loch Tarbert (Cantyre), Oban, Mallaig, Kyle of Lochalsh on the west coast; and Portree in Skye. See the body of this work.

**Railroads.**—The only places north of Glasgow on the west coast of Scotland which possess railroad communication are Oban, Ballachulish, Fort William, Appin, Kentallen, Arisaig, Mallaig, Kyle of Lochalsh, and Stronferry.

**Telegraph.**—The west coast of Scotland, being so deeply intersected by lochs, telegraphic communication on the mainland, as well

as between the islands and the mainland, is maintained by frequent recourse to submarine telegraph cables.

**Lloyd's signal stations.**—There is a station at Kildonan.

Two balls, placed horizontally, indicate that the station is temporarily closed and that no communication can be held.

Three balls, placed in the shape of a triangle, indicate that telegraphic communication is interrupted and that messages can not be sent by telegraph but will be forwarded by other means as soon as possible.

**Coal.**—Coal can be obtained at most of the ports in the Firth of Clyde and at Oban.

**Dry docks.**—There are dry docks at Troon, Ardrossan, Greenock, Port Glasgow, and Glasgow, and marine railways at Ayr, Ardrossan, Gourock, Greenock, Irvine, Port Glasgow, Bowling, Sandbank, and Oban. For particulars, see appendix.

**Buoyage—Uniform system.**—The following system of buoyage has been adopted for British waters. It depends mainly on shape, and leaves coloring to a great degree optional. The commissioners of northern lights have adopted red as the color for starboard hand buoys on entering, and black for those on the port hand; middle ground buoys may be either black and white or red and white:

1. The mariner when approaching the coast must determine his position on the chart, and must note the direction of the main current of flood tide.

NOTE.—For the area covered by this volume the main current of flood, for the purpose of this system of buoyage, is deemed to be the northgoing current.

2. The term “starboard hand” shall denote that side which would be on the right hand of the mariner either going with the main current of flood or entering a harbor, river, or estuary from seaward; the term “port hand” shall denote the left hand of the mariner under the same circumstances.

3. Buoys showing the pointed top of a cone above water shall be called conical, and shall always be starboard hand buoys, as above defined.

4. Buoys showing a flat top above water shall be called can, and shall always be port hand buoys, as above defined.

5. Buoys showing a domed top above water shall be called spherical, and shall mark the ends of middle grounds.

6. Buoys having a tall central structure on a broad base shall be called pillar buoys and, like other special buoys, such as bell buoys, light buoys, automatic sounding buoys, etc., shall be placed to mark special positions either on the coast or in the approaches to harbors, etc.

7. Buoys showing only a mast above water shall be called spar buoys.

8. Starboard hand buoys shall always be painted in one color only.

9. Port hand buoys shall be painted of another characteristic color: either single or parti-color.

10. Spherical buoys at the ends of the middle ground shall always be distinguishable by horizontal bands of white color.

11. Surmounting beacons, such as staff and globe, etc., shall always be painted of one dark color.

12. The staff and globe shall only be used on starboard hand buoys; staff and cage on port hand; diamonds at the outer ends of middle grounds; and triangles at the inner ends.

13. Buoys on the same side of a channel, estuary, or tide way may be distinguished from each other by names, numbers, or letters, and, where necessary, by a staff surmounted with the appropriate beacon.

14. Buoys intended for moorings, etc., may be of shape or color (other than green) according to the discretion of the authority within whose jurisdiction they are laid; but for marking submarine telegraph cables the color shall be green, with the word "Telegraph" painted thereon in white letters.

15. **Buoys and marking of wrecks.**—Wreck buoys in the open sea or in the approaches to a harbor or estuary shall be colored green with the word "Wreck" in white letters on them.

16. When a wreck-marking buoy is used it shall be one of the following shapes, and (if a light is carried) it shall be lighted in one of the manners following to indicate to the mariner on which hand he should pass the buoy.

(a) A can-shaped light buoy showing a green light giving two flashes should be passed on the port hand.

(b) A conical-shaped light buoy showing a green light giving three flashes should be passed on the starboard hand.

(c) A spherical-shaped light buoy showing a green light giving one flash should be passed on either side.

17. When a wreck-marking vessel is used, she shall, if possible, have her top sides colored green, with the word "Wreck" in white letters thereon, and shall exhibit between sunset and sunrise the following lights:

(a) To be passed on the mariner's port hand—Two green lights in a vertical line not less than 6 feet apart from the end of a cross yard, the lower light to be of a height not less than 15 feet (4.6 m.) above the hull.

(b) To be passed on the mariner's starboard hand—Three green lights in a vertical line not less than 6 feet apart from the end of a cross yard, the lowest light to be of a height not less than 9 feet (2.7 m.) above the hull.

(c) To be passed on either side: Four green lights, two in a vertical line one over the other, not less than 6 feet apart, on each

end of a cross yard with a horizontal distance between the lights at either end of the cross yard not less than 15 feet and not exceeding 25 feet. The height of the two lower lights to be not less than 15 feet (4.6 m.) above the hull.

A wreck-marking vessel shall not carry the ordinary riding light for a vessel at anchor.

Between sunrise and sunset to carry green balls or shapes corresponding in number and arrangement to the green lights as detailed above.

**Fog signal.**—A wreck-marking vessel during fog, mist, falling snow, or heavy rainstorms, whether by day or night, will ring a deep-toned bell at intervals of not more than 30 seconds as follows:

Two strokes in succession when the vessel is to be passed on the mariner's port hand.

Three strokes in succession when the vessel is to be passed on the mariner's starboard hand.

Four strokes in succession when the vessel can be passed on either side.

**Pilot signals.**—The following signals are to be made by any vessel requiring a pilot on the coasts of the United Kingdom.

By day—

1. The pilot jack (union jack with white border) hoisted at the fore; or

2. The pilot signal P. T. of the international code; or

3. The international code flag S. (white with small blue square center) with or without the code pennant over it; or

4. The distant signal, two balls or shapes resembling balls, hoisted above a cone, point upward.

At night—

1. A blue light every 15 minutes; or

2. A bright white light, flashed or shown at short or frequent intervals, just above the bulwarks, for about 1 minute at a time.

These signals, when displayed together or separately, shall be deemed signals for a pilot, and must only be used by vessels when a pilot is required.

**Light-vessel signals.**—When a light vessel is driven from her proper position to one where she is of no use as a guide to shipping, the following signals will be made, viz: The usual lights are not exhibited, but a fixed red light will be exhibited at each end of the vessel, and a red flare shown every quarter of an hour. In case of fog, the usual signal required by the regulations for a vessel at anchor will be made. By day, the balls, or other distinguishing masthead marks (if they have any) are struck. If from any cause a light vessel is unable to exhibit her usual lights while at her station, the riding light only is shown.

When from any lightship a vessel is seen standing into danger, a gun or rocket is fired and repeated until observed by the vessel; also the signal J D of the International Code, "You are standing into danger," is hoisted.

**Lifeboats.**—Lifeboats belonging to the Royal National Lifeboat Institution are stationed at Port Logan, Port Patrick, Girvan, Ayr, Troon, Machrihanish, Ardrossan, Southend, and at Campbeltown.

**Signals.**—The following signals are made from the lighthouses at Turnberry Point, Sanda Island, Davarr Island, and Pladda Island, which are in proximity to lifeboat stations, for the purpose of summoning lifeboats when their services are required:

By day and at night: Two explosive rocket, in quick succession, every 5 minutes until replied to by the nearest lifeboat station.

Reply: A red flag by day; two red star rockets at night.

**Life-saving apparatus.**—At Drummore, Port Patrick, Ballantrae, Ayr, Ardrossan, Southend, Campbeltown, Kilchearan, and Kildonan, the rocket life-saving apparatus, supplied by the board of trade, is worked by the coast guard or by volunteer life brigades.

**Aircraft distress signals.**—When any aircraft is in distress and requires assistance, the following shall be the signals displayed by her, either together or separately:

1. The international signal S O S by means of visual or radio telegraphy.

2. The International Code signal of distress indicated by N C.

3. The distant signal consisting of a square flag having above or below it a ball or anything resembling a ball.

4. A continuous sounding with any sound apparatus.

5. A signal consisting of a succession of white Very's lights, fired at short intervals.

6. A white flare from which at intervals of about 3 seconds a white light is ejected into the air.

The above signals are subject to such modification as shall be published from time to time.

**Vessels accompanying submarines.**—Attention is specially drawn to the following information with regard to vessels accompanying British submarines:

British men-of-war, auxiliary patrol vessels, royal fleet and mercantile fleet auxiliary, and all British merchant vessels, whenever proceeding in company with submarines, will fly flag "M" of the International Code at the masthead, accompanied by a group from the numeral table of the same code, indicating the number of submarines in company. This signal is a warning to vessels that submarines are in the vicinity. When flag "M" is displayed vessels are cautioned to steer so as to give the escorting vessel a berth of at

least 1 mile, and also to pass astern of her. When from any cause this can not be done, the escorting vessel should be approached at slow speed until warning is given of the danger zone by flags, semaphore, or megaphone, as most convenient, a good lookout being kept meanwhile for the submarines, whose presence may be only indicated by their periscopes showing above the water.

**Single ships approaching squadrons.**—The attention of ship-owners and masters is called to the danger to all concerned which is caused by single vessels approaching a squadron of warships so closely as to involve risk of collision or attempting to pass ahead of or through or to break the line of such squadron. It is necessary to warn mariners that on such occasions it would be in the interests of safety for single vessels to adopt timely measures to keep out of the way of and avoid passing through a squadron. In circumstances where a single vessel has been unable to take timely measures to keep out of the way of a squadron, the "Regulations for Preventing Collisions at Sea" must be the guide.

**Sweeping.**—British naval vessels are frequently engaged in sweeping operations off ports in the United Kingdom.

While so engaged, they work in pairs, connected by a wire hawser, and are consequently hampered to a very considerable extent in their maneuvering powers.

With a view to indicate the nature of the work on which these vessels are engaged, they will show the following signals:

A black ball at the foremast head and a similar ball at the yard-arm, or where it can best be seen, on that side on which it is dangerous for vessels to pass.

For mutual safety, other vessels, whether steamers or sailing craft, should endeavor, without violating the rule of the road, to keep out of the way of vessels flying this signal, and should especially remember that it is dangerous to pass between the vessels of a pair.

**Speed trials.**—Flag A, International Code (white swallow-tailed flag with a blue fly), when flown by British naval or other ships in the vicinity of any measured distance on the coasts of the British Isles, indicates that such vessels are running speed trials on that measured distance.

For mutual safety, all other vessels, both steam and sailing, should endeavor to keep out of the way while these trials are in progress.

**Searchlights.**—Any vessel approaching a port in the British Empire when searchlights are being worked, and fearing that they interfere with her safe navigation, may make use of the following signals, either singly or combined:

(a) By flashing lamp, four short flashes followed by one long flash.



(b) By whistle, siren, or fog horn, four short blasts followed by one long blast.

Whenever possible, both flashing lamp signals and sound signals should be used.

On these signals being made, the searchlights will be worked so as to cause the least inconvenience, being either extinguished, raised, or their direction altered.

The signals should not be used without real necessity, as unless the vessel is actually in the rays of the searchlight it is impossible to know which searchlight is affected. The signals should be repeated until the inconvenience is removed.

These signals are designed to assist mariners and do not render the Government liable in any way.

**Sunken mines.**—Sunken mines still exist in certain areas whose limits are shown on the backs of Hydrographic Office charts of waters where such dangers exist. When in those areas vessels are recommended not to anchor except in an emergency, nor to trawl without using some safety device to prevent mines entering the trawl.

**Destruction of mines.**—The attention of masters is drawn to the great desirability of taking every opportunity of sinking drifting mines in order to free the seas of them within a reasonable period.

Whenever practicable, vessels should attempt to sink or destroy mines by gun or rifle fire, but no mine is to be sunk in any fairway where the depth of water at low water spring tides is less than 7 fathoms, except when a mine is drifting toward a vessel at anchor, and no vessel should approach within 200 yards of a mine while attempting to sink or destroy it.

Before hoisting the mine flag or reporting a mine which has been left afloat, every care should be taken to confirm that the object actually is a mine, in order to prevent unnecessary confusion; the mine flag is a square flag, white over blue diagonal.

**Caution when approaching British ports.**—See Appendix II.

**Fishing grounds.**—Trawlers do not fish in fleets on the west coast of Scotland, but singly or in groups of twos or threes. The vicinities of the west coast of Islay and Skye are their favorite grounds; they are also found in the areas given below. Foreign trawlers are to be found in the Firth of Clyde.

Drift-net fishers follow the movements of the herring shoals, which are uncertain, but they will generally be found in the areas given below. Long-line fishers are seldom in fleets.

In January drift-net fishing is carried on in the Sea of the Hebrides between Tiree and Coll and Barra Islands; there are a number of long-line fishers on the west coast.

In February trawling is carried on in an area about 23 miles in extent southwestward of Dubh Artach; there are a large number of long-line fishers on the west coast.

In March trawling is carried on in an area about 30 miles in extent southwestward of Stanton Banks.

In April trawling is carried on in the same area as in March; there are a few long-line fishers on the west coast.

In May trawling is carried on in the same area as in March, but extending a little further westward, and drift-net fishing in Kilbrennan Sound and Loch Fyne. There are a few long-line fishers on the west coast.

In June trawling is carried on in an area 30 to 40 miles in extent westward and southwestward of Stanton Banks, and drift-net fishing in Kilbrennan Sound and southward of Ailsa Craig, Loch Fyne, for some 7 miles northwestward of Skerryvore, Tiree, and Coll, and the same distance westward of Canna.

In July, August, September, and October trawling is carried on in an area about 30 miles in extent southward and southwestward of Stanton Banks, and drift-net fishing in Loch Fyne, Kilbrennan Sound and its approach from the southward; also, in September and October, over Stanton Banks, and in October in the western part of the Firth of Clyde between the Small Isles and Skye, in Inner and Raasay Sounds, and off the west coast northward of Loch Torridon. During these months long-line fishing is suspended.

In November drift-net fishing is carried on over Stanton Banks, the southern part of Kilbrennan Sound, between the Small Isles and Skye, and in Raasay and Inner Sounds. A few long-line fishers will be found on the west coast.

In December drift-end fishing is carried on in the southern part of Kilbrennan Sound, between the Small Isles and Skye, and in Raasay and Inner Sounds. There are a large number of long-line fishers on the west coast.

**Fishing vessels.**—Methods of avoiding damage to their gear:

Vessels should, if possible, avoid passing through a fleet of drifters. Even a single vessel may have considerable difficulty in doing so without damage to nets, because the nets of one boat lie so close to those of another that in maneuvering to pass the end of one line a vessel is very apt to find herself in the middle of another. If forced by circumstances to cross a line of drift-nets the least damage will be done by crossing them at right angles, midway between two of their buoys, at a fair speed. If possible, propellers should be stopped while passing over the nets. The mere parting of a net does no great harm, but a revolving propeller may draw up the headline and net, thereby doing considerable damage. Cases have been reported of

large steamers having to be towed into port helpless after fouling drift-nets.

Mackerel and pilchard nets are on the surface, and there is no means of avoiding them except by keeping clear of them.

At night, it should be remembered that the nets lies in the direction of the wind, with the drifter at their lee end, so if the latter is passed to leeward the vessel is bound to clear the nets. When nets are being hauled at night powerful acetylene lamps are used on deck.

Drifters carry very bright lights at night, usually visible 5 miles in clear weather.

The rules of the road should be strictly adhered to with regard to lights carried by fishing vessels.

A drifter usually lies stern on to her nets. In this case she always has her mizzen set; if stern on she has no mizzen set.

The nets of British drifters vary from 1 to 4 miles in length, and their tops are secured to the warp which, except in the case of mackerel and pilchard nets, lies about 2 fathoms below the surface. The end of the line of nets is marked by a buoy and a flag, or by a white float, and there are intermediate red or green buoys or floats at about 40 yards apart.

French, Dutch, and German drifters' nets are of a heavier type, the warp being 3 fathoms below the surface. They vary in length from 2 to 4 miles, and are marked by flags as well as by floats.

**Points to which attention is directed.**—In places where drift-net fishing is being carried on, if two white lights are seen at night they probably belong to a drifter.

If a steam or sailing vessel is seen by day with the foremast down and mizen set, that vessel is a drifter riding to her nets.

The ends of the nets may or may not be specially marked with a staff and flag, or a white float.

If a fleet of drifters is passed through at night it is impossible to avoid the nets.

If a vessel has to pass close to a drifter she should pass to leeward of her; by night, the higher light shows the clear side, and the lower light shows the direction in which the nets extend.

It is best for drifters to be avoided altogether.

**Special signals and lights.**—The following signals have been agreed upon by the fishing industry for the use of British seine-net fishing vessels, when actually fishing with seine nets, for the purpose of protecting their gear from injury by other vessels.

**By day.**—One black ball, basket, or shape, in the fore part of the vessel as near to the stem as possible, not less than 10 feet above the rail.

One black triangle apex upwards on the yardarm on the mizzen mast on the side from which the net is being operated.

**By night.**—Three white lights in a triangle, the sides of which are approximately  $2\frac{1}{2}$  feet, apex upwards from the yard on the side of the vessel from which the gear is leading. The signal is to be used in conjunction with the side lights when running the gear and without the side lights when hauling the gear.

**Sound signal.**—Two long and one short blasts on the whistle when being approached by other vessels.

When a vessel of this description is at anchor at night and not working gear, the usual anchor lights, as prescribed by article 9 of the Regulations for Preventing Collisions at Sea, 1910, will be shown and no other lights should be exhibited.

The above signals will indicate that a vessel is engaged in fishing with a seine net, in order that other vessels approaching may give the seine net vessel a wide berth.

The area covered by the nets and warps may be as much as a square mile in extent.

**Approaching the land.**—Vessels from the westward bound to the Clyde or any port in the Irish Sea, usually make Tory Island, which is steep-to and has a good light and fog signal. If bound to the east coast of Scotland or to any of the northern ports in Europe, they usually pass northward of the Outer Hebrides, and, if possible, sight the Butt of Lewis, and then proceed either through Pentland Firth or between the Orkney and Shetland Islands.

The route northward of Scotland, when bound to British ports northward of the Firth of Forth, is for vessels from the Azores or ports in the United States or Canada, as short or shorter than the route up the English Channel and the North Sea, the southern part of which is encumbered with shoals.

**Route along the coast.**—The route along the coast, in which there is shelter and many anchorages, is through the Sound of Islay, the Firth of Lorn, the Sound of Mull to Ardnamurchan Point, through Sleat Sound, Kyle Rhea, Kyle Akin, Inner Sound, and the Minch.

**Magnetic variation.**—The general direction of the lines of equal magnetic variation in the area dealt with in this work is about  $14^{\circ}$ — $194^{\circ}$ . The variation for 1925 varies from  $19^{\circ} 00' W.$  at the north end of Skye to  $17^{\circ} 20' W.$  at the Mull of Galloway, and its annual change is about 9 minutes, decreasing.

**Soundings.**—The 100-fathom (182.9 m.) curve extends a considerable distance westward of the land, but there are areas inside that line that have not yet been completely sounded.

**Ice.**—During recent years ice has been met with in the North Atlantic very much farther south than any previously reported, and some in close proximity to the British Islands.

**Winds.**—During the winter months (December to March) pressure is lowest between Iceland and southern Greenland and rises toward the Irish coast, therefore the prevailing winds between Iceland and northern France are southwesterly in accordance with Buys Ballot's law. In April and May the low-pressure area near Iceland becomes much less marked; at the same time pressure rises over the Atlantic west of Ireland. Hence the winds become more westerly, and remain so through the summer; their force is also less with occasional calms. In November the Icelandic minimum again becomes prominent and southwest winds predominate, while the average force of the wind becomes greater.

The mean direction of the wind for all Scotland is about west-southwest, winds from between southwest and west prevailing for 140 days in the year; and the wind blows with least frequency from about north-northeast, winds from between north and north-northeast prevailing on 53 days.

On the west coast of Scotland the prevalence of southwesterly winds is much greater, the wind having a tendency to take the general direction of the land as it is approached, so that while on the southwestern coast westerly winds generally become southerly winds, on the northwestern coast they become southwesterly.

In the North Channel, between Ireland and the southwestern part of Scotland, the winds are commonly from north or south, those from the southward, as compared with those from the northward, being in the proportion of about 3 to 2.

At times an anticyclonic system becomes established, and over the area subject to its influence, which is often of great extent, the wind is generally light or moderate in force, and the weather fine.

Calms of any duration are of very rare occurrence even in summer; during a calm, should there be much swell in the offing, or a heavy surf on the shore, it is an indication of approaching bad weather.

**Gales** or strong winds are by no means unfrequent; they are usually of a cyclonic character, traveling from some west point to the eastward. The greatest number pass between the northwest coast of Scotland and Iceland, producing gales from southeast shifting to southwest when in positions to the southward of their track. It is, however, not uncommon for these depressions to pass across Great Britain, and when in positions to the northward of their track the wind backs to east and north.

The following table has been compiled at the Meteorological Office, London, from data extending over a period of years (1876 to 1915).

A gale is a wind blowing with force 8 or over (39 miles per hour or more) at one or more stations in the district. A severe gale is one

in which force 10 (55 miles per hour or more) is reached at one or more stations.

Period	Northwest coast of Scotland; Pentland Firth to I. of Mull and Loch Linnhe	West coast of Scotland and north of Ireland; I. of Mull to Mull of Galloway, and Belmullet to Donaghadee
1. Average number of gales in one whole year.....	30	27
2. Average number of gales during 6 months from October to March inclusive.....	6	4
3. Average number of gales during 6 months from April to September inclusive.....	24	21
4. Average direction of gales for one whole year; i. e., the quarter from which they blow.....	6	5
	3	3
	4	4
	13	10
	10	10

Odds against the occurrence of a gale on the west coast of Scotland on any day in the various months of the year, based upon records extending over the 40 years, 1876–1916:

Locality	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Scotland, northwest.....	5	6	9	19	30	74	61	43	14	10	6	5	11
Scotland, west.....	7	7	11	22	43	74	102	33	17	10	7	6	13

**Storm signals.**—Storm signals are shown at Stranraer, Mull of Galloway, Corsewall Point, Ballantrae, Rinns of Islay, Rudha Mhail, Glass Island, Ardrrossan, Greenock, Campbeltown, and Mull of Cantyre. They are hoisted on information received by telegraph from the meteorological office, and the notice is usually posted up at the harbor office.

If a gale has commenced before warnings are issued, notice to hoist the cone will still be sent if it is expected that the gale will continue or increase in force, but not otherwise.

The warning is intended to continue from the time the notice leaves the meteorological office until 8 p. m. on the following day.

As weather information is only received at the meteorological office at 8 a. m., 2 p. m., and 6 p. m., a gale may have reached a station and passed on during the night before the meteorological office is in a position to order the signal to be lowered.

These storm signals only refer to the greater and more general disturbances which may appear to be approaching. Local winds of gale force may occur for which no warning can be given, and observers must watch their own barometers and local signs of weather.

The fact that a storm warning has been received at any place is made known by hoisting a canvas cone, which has the appearance of

a black triangle. At night three lanterns showing lights of the same color may be hoisted in place of the cone.

**Meaning of signal.**—The hoisting of such a signal is a sign that an atmospheric disturbance is in existence which will probably cause a gale of a force of 8 or more by Beaufort scale from the quarter indicated by the character of the signal displayed, either at or within a distance of (say) 50 miles of the place where the signal is hoisted. The signal is frequently kept shown after a gale is over; this is the case because one gale is often followed by another within a very brief interval, before there would be time to issue a fresh warning. But whenever there is a reason to believe that danger is over, notice is sent from the meteorological office to lower the signal.

**Southerly gale.**—The cone or lights, point down, indicates that gales or strong winds are probable from the southward; that is, from southeast round by south to northwest.

**Northerly gale.**—The cone or lights, point up, indicates that gales or strong winds are probable from the northward; that is, from northwest round by north to southeast.

**Westerly gales.**—Should it appear likely that a gale will begin from between west and northwest, and also that it is likely to veer toward north or northeast, the north cone will be hoisted in preference to the south cone.

**Easterly gale.**—Should it appear likely that a gale will begin from between east and southeast, and also that it is likely to veer toward south or southwest, the south cone will be hoisted in preference to the north cone.

**Fog.**—Fog is very common on the west coast of Scotland, chiefly with light winds and a high barometric pressure (anticyclones), and is more frequent in spring, summer, and autumn than in winter, except in the upper part of the Firth of Clyde, where the reverse appears to be the case. The following table gives a good idea of the frequency of fog:

*Hours of fog registered, a mean for each month for four years, 1895–1898*

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mull of Galloway.....	34	19	38	40	35	69	31	30	32	9	12	7
Ailsa Craig.....	7	9	4	5	4½	23	4	6	12	13	12	2½
Mull of Cantyre.....	10	8	4½	10	28	46	25	10	19	1	½	1
Oversay.....	9	7	4½	5½	38	44	32	13	14	1	½	0
Skerryvore.....	10	11	8	8	27	41	13	3	19	4	0	½
Sound of Mull.....	2	0	0	0	1½	12	7	4	6	0	0	0
Isle of Ornsay.....	1½	10	4	12	6½	17	6	3	9	1	1	0
Kyle Akin.....	0	0	0	0	5	5	0	½	0	0	0	0

In the British Islands and adjacent waters the mean barometrical pressure ranges in midwinter from 30 inches, in the south, to 29.8

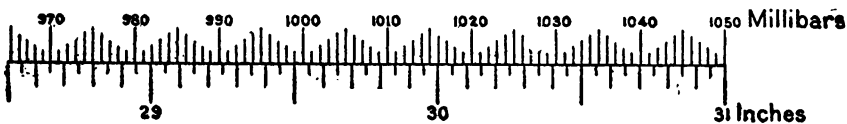
inches, in the north, and similarly in midsummer from 30 inches to 29.85 inches.

The temperature, as a rule, in the northern hemisphere, rises with southeast winds, has its maximum with south and southwest winds, falls with west, northwest, and north winds, and has its minimum at northeast.

**Barometer and thermometer.**—The following table gives the monthly average height of the barometer, with the monthly range, and the monthly temperature with the daily range, for 55 stations in Scotland, the mean position being latitude  $56^{\circ} 30' N.$ , longitude  $3^{\circ} 40' W.$ , and the mean elevation 256 feet (78 m.).

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Mean height of barometer.....	<i>Ins.</i> 29.72	<i>Ins.</i> 29.83	<i>Ins.</i> 29.75	<i>Ins.</i> 29.90	<i>Ins.</i> 29.92	<i>Ins.</i> 29.94	<i>Ins.</i> 29.91	<i>Ins.</i> 29.86	<i>Ins.</i> 29.81	<i>Ins.</i> 29.81	<i>Ins.</i> 29.86	<i>Ins.</i> 29.78
Mean monthly range.....	1.64	1.57	1.47	1.23	1.00	0.90	0.90	0.91	1.19	1.41	1.55	1.57
Mean temperature.....	36.9	38.3	39.4	44.7	49.3	55.2	57.3	56.8	53.1	46.9	40.3	38.8
Mean daily range.....	8.6	9.7	11.3	14.0	15.1	15.0	15.0	14.2	13.3	11.7	10.1	9.0

**Barometer readings.**—The graduation of barometric scales in millibars having now been largely introduced, the accompanying diagram is inserted to enable the mariner to obtain the equivalent of millibars in inches, and vice versa.



**Rainfall.**—The climate of the west coast is very moist, but some localities differ greatly from others in this respect, owing to the varying height and configuration of the land, the rainfall as a rule increasing greatly in ascending valleys toward the mountains at their heads, and also being much greater at the heads of the many sea lochs than at their entrances.

The wettest month is December, and the driest April as far north along the coast as Greenock, with June in the islands and farther north. The average annual rainfall during the period 1881–1915 at Corsewall Lighthouse is 34.1 inches, the rain gauge being 112 feet above the sea level; at Greenock 61.6 inches, 199 feet above sea; at Skipness Castle 48.8 inches, 14 feet above sea; at Poltalloch 52.2 inches, 132 feet above sea; at Ellabus in Islay 48.9 inches, 68 feet above sea; at Quinish near Loch Cuan, Isle of Mull, 56.7 inches, 35 feet above sea; and at Arisaig House 62.9 inches, 30 feet above sea.



**Snow.**—Changes from rain to hail, and in winter to snow, often accompany or even precede changes in the direction of the wind from a southern to a northern point of the compass. When after a sudden and heavy snow squall on such an occasion the weather clears any land which may have been previously in sight is usually so completely altered in aspect as to be exceedingly difficult of recognition; snow, however, seldom lies on the ground for any length of time on the west coast of Scotland or the islands, though on the mountains it frequently remains for weeks at a time.

**Radio weather bulletins** are transmitted to shipping in the waters described by this book. For particulars see *Radio Aids to Navigation*, H. O. No. 205.

**Tides.**—On the west coast of Scotland, from Islay to Cape Wrath, high water occurs from 5 to 7½ hours after the moon's transit, the times being generally earlier offshore than inshore and to the southward than to the northward; the rise at springs is from 6 to 16 feet, depending on local circumstances.

Between a line extending southwest from Islay and a line extending southwest from the east side of the Mull of Cantyre high water depends both on the west coast of Scotland and the Irish Sea tides; as the times of high water of these tides are separated by about 6 hours, the time of high water between the lines is variable, and the rise of the tide is small.

South and east of a line drawn southwest from the east side of the Mull of Cantyre and in the Firth of Clyde high water occurs from 11 to 12 hours after the moon's transit; being earlier in the southern than in the northern part of this area; the rise at springs is about 21 feet at the entrance to the Solway Firth and decreases to about 9 feet in the Firth of Clyde.

**Tidal currents.**—In the area bounded on the southwest by the coast of Ireland, from Tory Island to St. Johns Point, in the North Channel and Irish Sea; on the southeast by a line from St. Johns Point to Ayre Point, in the Isle of Man, and thence to the north point of Walney Island; on the northeast by the west coasts of England and Scotland, from Walney Island to the Mull of Cantyre, and thence to Ardnamurchan Point along the west coasts of Islay and Mull; and on the northwest by a line from Tory Island to Ardnamurchan Point, through the Islands of Skerryvore, Tiree, and Coll, the whole body of water moves inwards toward the Clyde and Solway Firths while the water is rising at Dover, and outwards with a falling tide at a rate varying from 3 to 5 knots. Off Oversay the current is said to attain a rate of 7 knots.

In the intermediate area between the area just described and a line between the Butt of Lewis and Cape Wrath the water sometimes moves southward and sometimes northward, the line of junction or

separation commencing near the islands of Coll and Tiree and working gradually northward. At 1 hour after high water at Dover the currents meet near Coll and Tiree; 2 hours after high water at Dover the line of junction is between Canna Island and the Hebrides; 3 hours after high water at Dover it is about 15 miles northward of Canna Island; 4 hours after high water at Dover it is in the narrows between Skye and Hebrides; 5 hours after high water at Dover it is north of the Shiant Islands; and 6 hours after high water at Dover abreast of Stornoway. With the rising tide at Dover the line of separation of the water commences at Coll and Tiree and works gradually northward as the line of junction does.

**North Channel.**—The tidal current, which sets between the north coast of Ireland and Islay toward and through the North Channel into the Irish Sea, after passing Islay, expands eastward in the opening between that island and the Mull of Cantyre, and striking the coast of Cantyre between the Mull and Machrihanish Bay, is there joined by the current running southward from the Bay of Islay, and both are diverted round Skerrinagal toward the Mull and the main body of the current setting through the North Channel, the rate of the combined currents round the Mull of Cantyre being 5 to 6 knots at springs. A portion of the current that impinges on the coast of Cantyre is turned northward toward Gigha Sound.

After passing the Mull of Cantyre the current crosses the entrance to the Firth of Clyde and expands on its eastern side in its progress southeastward, until it reaches the coast near Bennan Head, where it divides, one part running northeastward along the coasts of Wigtonshire and Ayrshire and the other part setting southwestward past the entrance to Loch Ryan to Corsewall Point, where it again joins the main current through the North Channel, and then it runs along the land from Corsewall Point to the Mull of Galloway at a rate of from 4 to 5 knots at springs until it reaches that Mull, round which it runs at a rate of 6 knots at springs.

This in-going current through the North Channel runs in a general south-southeasterly direction from 5 hours before until the time of high water at Dover, but close in-shore it may run for a slightly longer or shorter period.

The out-going current runs almost directly in the opposite direction to the in-going current. The current along shore from the Mull of Galloway to Corsewall Point expands after passing that point, and meets, near Bennan Head, the current running southwestward along the coasts of Ayrshire and Wigtonshire, and the combined currents move northwestward toward Sanda Island and the Mull of Cantyre.

The current, after passing the Mull of Cantyre, expands to the eastward, and is joined by the current setting southwestward from

Gigha Sound along the coast of Cantyre near Skerrinagal; the combined currents move northwestward and pass southwestward of Islay, but a portion runs northward toward and through the Sound of Islay.

Although the rate of both the in-going and out-going currents is as much as 5 knots, or even 6 knots close to some salient point, their general rate throughout the area occupied by them is about 3 knots.

The out-going current runs in a general north-northwesterly direction from 1 hour after to 6 hours after high water at Dover.

**Firth of Clyde.**—The in-going current through North Channel, after passing the Mull of Cantyre, spreads to the eastward as it crosses the entrance to the Firth of Clyde, and on meeting the land near Bennan Head, there divides, one part running northeastward and the other part southwestward along the coast. The northeast-going part has a rate of about  $2\frac{1}{2}$  knots at springs, and the southwest-going part a rate of 3 knots, increasing to 4 knots as Corsewall point is approached.

On the northwestern side of the entrance to the firth, the in-going current running through Sanda Sound turns northward round the peninsula of Cantyre, and sets up Kilbrennan Sound at a rate of  $2\frac{1}{2}$  knots at springs, while that part of the in-going current passing southward of Sanda Island, which is locally known as the "Black tide," sets toward the Island of Pladda, at the southern end of Arran. It is practically high water simultaneously throughout the Firth of Clyde at 1 hour after high water at Dover, and the tidal currents are mostly moderate in rate; but where a channel is contracted, or much shallower than the areas on each side of it, the currents attain a considerable rate.

The current progresses up the firth in 3 main lines: Northward, through Kilbrennan Sound and into Loch Fyne; eastward of Arran Island and between it and Bute Island, and thence up the West Kyle of Bute and round into the East Kyle; and along the coasts of Wigtonshire and Ayrshire to the inner part of the Firth of Clyde and the lochs branching off it.

The outgoing currents run in the opposite directions to the in-going currents. The currents, and also the vertical rise, are much affected by the wind. Northerly winds retard the in-going currents and lower the level of the water; southerly winds have a contrary effect.

**Mull of Cantyre to the Island of Mull.**—It is high water on the northwestern coasts of Islay, Jura, and Scarba, almost simultaneously at about  $5\frac{1}{2}$  hours before high water at Dover, on the days of full and change, and low water about half an hour after high water at Dover, and the rise at springs is from 11 to 13 feet. On

the southeastern coasts of these islands, although it is high and low, water at nearly the same time as on the northwestern coasts, the rise at springs is only from 3 to 6 feet. Consequently at high-water springs there is a difference of about 4 feet in the height of the water on the northwestern coast of those islands from that on their southeastern coasts, as well as over the channel separating them from the mainland.

This causes the tidal currents to run southward and eastward with great rapidity, 6 to 8 knots, through the Sound of Islay and the Gulf of Corryvreckan, etc., from about  $11\frac{1}{2}$  hours before it is high water in them, or about 5 hours after high water at Dover until 1 hour before the following high water there.

At low water, the height of the water on the northwestern coasts of Islay and Jura is 4 feet lower than on the southeastern coasts of those islands, and this causes the water to run northward and westward through the Sound of Islay and the Gulf of Corryvreckan, etc., also at a rate of 6 to 8 knots at springs, from about  $11\frac{1}{2}$  hours before it is low water in them, or about 1 hour before high water at Dover until 5 hours after high water there.

When it is high water at Islay and Jura it is low water in the Solway Firth, and while on the northwestern coast of those islands the water is at a height, at springs, of 5 to 6 feet above mean tide level, it is about 13 feet below that level between the Solway Firth and the Mersey River, a difference of level of 19 feet in 150 miles. Consequently the water flows from all directions toward the North Channel, between the northern coast of Ireland and the southern coast of Islay, from 6 hours before until high water at Dover, and northwestward from high water at Dover until 6 hours after high water there. These currents have a general rate of 2 to 3 knots, but close off the salient points of the southern coast of Islay reach a rate of 5 to 7 knots, causing overfalls and races. The rapidity of these currents also causes overfalls on the banks in the channel between Islay and Ireland.

The currents through the channel between Islay and Ireland meet, or separate from, those passing through the Sound of Islay and the Gulf of Corryvreckan, of Skerrinagal, but a part of the current from Islay Sound turns northeastward along the shore between Skerrinagal and Glenacardock Point.

When it is high water between the Mersey River and Solway Firth it is low water on the northwestern coasts of Islay and Jura, and the tidal current runs northwestward and northward through the channel between Ireland and Islay and through the channel between the Peninsula of Cantyre and Islay and Jura toward the Sound of Islay, the Gulf of Corryvreckan, and the Sound of Scarba, etc., the

point of separation being off Skerrinagal; but northeastward of that point the current sets southwestward along the shore from Gigha Sound and turns to the northward between Glenacardock Point and Skerrinagal, where it joins the current running through the Sound of Jura.

In the wide opening between the coast of Ireland and Islay, the current has a general movement south-southeastward and through the North Channel, but spreads laterally northeastward to the Sound of Jura after passing the south point of Islay; it is diverted again toward the Mull of Cantyre by the southgoing current through the Sound of Islay.

In the Sound of Islay, the Gulf of Corryvreckan, etc., a rapid current passes through a narrow opening into a wide area, and the current running through retains its direction and width for some distance after emerging from the narrows, producing eddies, which run back toward the land on each side of the rapid main current. Although along the southeast coasts of Islay and Jura it is high water almost simultaneously, at  $5\frac{1}{2}$  hours before high water at Dover, along the west side of the Peninsula of Cantyre the times of high water are very different; for instance, at the Gigha Islands it is high water  $3\frac{1}{2}$  hours after high water at Dover, or 3 hours before it is high water on the coasts of Islay and Jura, but the range of tide is very small and it is most irregular.

In the area between the northwestern coasts of Islay and Jura and the southern coast of the Island of Mull there is very little tidal current, owing probably to the tidal undulation rising gradually to a fairly uniform height of from 11 to 13 feet throughout it. Where, however, the current issues from the narrow channels separating Islay, Jura, and Scarba, it affects the area between those islands and Mull in the immediate vicinity of the narrows from which the currents emerge.

Throughout the Sound of Mull the current, as a general rule, runs northwestward with the rising and southeastward with the falling tide, but although it is high water simultaneously on the days of full and change at  $5\frac{1}{4}$  hours before it is high water at Dover, the change of current is not simultaneous, for the northwest-going current begins an hour earlier at the northern end of the sound than it does in the southern end. The southeast-going current begins almost simultaneously throughout the sound at about 5 hours before high water at Dover. The general rate of the currents is from  $1\frac{1}{2}$  to 2 knots.

**Island of Mull to Rudh' Re.**—The tidal current inshore from the Ross of Mull to the head of Kyle Rhea generally runs northeastward with the rising and southwestward with the falling tide on

the adjacent shore; but as the time of high water at the Ross of Mull and in the Sound of Iona is three-fourths of an hour earlier than in Kyle Rhea, the current does not turn simultaneously through this irregular channel, extending approximately a distance of 60 miles, and it is governed by the time occupied in filling or emptying each section of the channel. Thus while in the channel between the Ross of Mull and Skerryvore, 22 miles wide, the current runs northeastward from about high water at Dover until 6 hours after high water there, and southwestward from 6 hours before until high water at Dover, at a rate of 4 knots at Skerryvore, but of  $1\frac{1}{2}$  knots between Skerryvore and the Ross, the current between the northern point of Coll and Ardnamurchan Point runs northeastward from about  $1\frac{3}{4}$  hours after high water at Dover until about  $4\frac{1}{4}$  hours before the next high water there, and southwestward from about  $4\frac{1}{4}$  hours before until  $1\frac{3}{4}$  hours after high water at Dover, at a rate of  $1\frac{1}{4}$  knots at springs. From Ardnamurchan Point to the head of Kyle Rhea the currents change almost simultaneously, running northeastward from  $1\frac{3}{4}$  hours after high water at Dover until  $4\frac{1}{4}$  hours before the next high water there, and southwestward from  $4\frac{1}{4}$  hours before until  $1\frac{3}{4}$  hours after high water at Dover, at a rate of from 1 knot to  $1\frac{1}{2}$  knots until near the narrows of Kyle Rhea, where its rate rapidly increases. This northeast-going current, after passing through Kyle Rhea, fills Lochs Duich, Long, and Alsh, and has little effect on the currents in Inner Sound.

The current outside Tiree and Coll runs northeastward from about 1 to 7 hours after high water at Dover, and southwestward from 5 hours before to 1 hour after high water at Dover, at a general rate of from 1 to  $1\frac{1}{2}$  knots, but more rapidly over the rough ground off the southwestern end of Tiree, where dangerous overfalls are experienced, especially when the wind opposes the current. Northeastward of Tiree and Coll the northeast-going current is obstructed by the Small Isles, viz, Eigg, Rum, and Canna, and its rate increases in passing through the channels between them toward the southwest coast of Skye, on reaching which it turns northwestward toward Neist Point, running from  $1\frac{1}{2}$  hours after high water at Dover until  $4\frac{1}{2}$  hours before the next high water there. The southwest-going current, which runs in a southeasterly direction along the southwest coast of Skye from  $4\frac{1}{2}$  hours before until  $1\frac{1}{2}$  hours after high water at Dover, turns southward and southwestward on meeting the current running out of the lochs on the southwestern coast of Skye, and passes through the channels between the Small Isles onward to the westward of Tiree.

The currents through Raasay and Inner Sounds for the most part, as well as in the lochs on each side, are weak, owing to the main current between Skye and the Hebrides being diverted across the northern ends of the sounds from Rudha Hunish, the northern point of Skye, toward Rudh' Re. In the sounds the currents set, as a rule, southward with the rising and northward with the falling tide. The currents off the coast southward of Rudh' Re are weak.

## CHAPTER II

### THE MULL OF GALLOWAY TO THE MULL OF CANTYRE, INCLUDING THE FIRTH OF CLYDE, CLYDE RIVER, KILBRENNAN SOUND, AND THE LOCHS ON THE NORTHERN SIDE OF THE FIRTH

**Mull of Galloway** ( $54^{\circ} 38' \text{ N.}, 4^{\circ} 51' \text{ W.}$ ).—Luce Bay, on the eastern side of the Mull of Galloway (see H. O. Pub. No. 145; British Islands Pilot, Vol. II), contributes with Loch Ryan in Wigtonshire to form the Rinns of Galloway, a remarkable peninsula 25 miles long with a breadth varying from 2 to 5 miles, the isthmus separating Luce Bay from Loch Ryan being 5 miles across. The Mull of Galloway is the promontory comprising the southern portion of the Rinns and terminating in a point which is the southern extremity of Scotland. The Point of Mull, the southeastern extremity of the Mull of Galloway, on which stands the lighthouse, is a bold and precipitous headland 268 feet (81.7 m.) high and is the extremity of a small peninsula 1 mile in length and  $\frac{1}{4}$  mile in width, connected with the mainland by a narrow isthmus, on either side of which are East and West Tarbet Bays. The Mull is steep-to and as regards depth of water may be approached with a commanding breeze.

**Light.**—An occulting white light, 325 feet (99 m.) above water, visible 25 miles, is shown from a white stone lighthouse, 86 feet (26.2 m.) high, near the southeastern extremity of the Mull.

**Caution.**—Owing to the great altitude of this light it is frequently obscured by haze or by low-lying clouds and cases have occurred of vessels, supposed to be westward of the light, having run eastward of it into Luce Bay.

**Fog signal.**—A siren, 165 feet (50.3 m.) above water, is sounded at the lighthouse. See Light List.

**Storm signals** are exhibited at this lighthouse, which is connected with Drummore Post Office by telephone.

**Tides.**—It is high water, full and change, at the Mull of Galloway at 11h. 15m.; springs rise 15 feet; neaps 12 feet.

**Race.**—A race and overfalls of a dangerous character, especially with a weather-going current, extends 2 miles off the Mull, and it is prudent to preserve an offing of 3 miles, in order to keep outside it. During the south-going current it takes a northeasterly direction from the Mull toward Sinniness, in Luce Bay, but during the north-going current it is situated close northwestward of the Mull. The



rate of the currents off the Mull is 6 knots at springs and 4 knots at neaps.

**The coast.**—The Rinns of Galloway are hilly, Cairn Piot, the highest part, being 583 feet (177.7 m.) high. There are many indentations, but no natural harbors along the western coast of the Rinns, which is generally bold, except in the vicinity of Laggan Head. This coast should be given a good berth.

**Port Logan**, about 7 miles northward of the Mull of Galloway, lies at the head of Nessock Bay, and has a pier in a ruinous state.

**Lifeboat.**—A lifeboat is stationed near the village at Port Logan.

**Crummag Head—Light.**—A flashing white light, 100 feet (30.5 m.) above water, visible 11 miles, is shown from a small white tower on the head.

**Port Patrick** (54° 50' N., 5° 07' W.), 15 miles northward of the Mull of Galloway, was formed in a small natural indentation in the clifly coast of the Rinns, its entrance being between two stone piers 280 feet apart. The north pier was connected with McCook Craig, a small rocky islet, by a breastwork, and within the islet on its northern side was a small bight with from 6 to 8 feet (1.8 to 2.4 m.) water; farther northward is a wet basin, about 200 feet square, having an average depth of 9½ feet (2.9 m.); this latter work is intact.

In consequence of the demolition of the harbor works by gales, the buoyage of the channel has been abandoned, and the management of the harbor relinquished. In 1892, with the exception of a small portion of the south pier, both piers, together with the upper portion of the breastwork which connected McCook Craig with the north pier, had been completely demolished. The southern side of the entrance was much fouled by the débris of the south pier.

There is a depth of 7 feet (2.1 m.) at low water in some parts of the fairway.

The village is situated on the shores of the harbor; in 1921 it had 1,495 inhabitants, who are chiefly occupied in agricultural pursuits, with occasional fishing during the winter. At the village is the terminus of the Port Patrick and Wigtonshire Joint Railway.

**Tides.**—It is high water, full and change, at Port Patrick at 11h. 10m.; springs rise 15 feet, neaps 12 feet. During springs, the tidal currents set across the entrance of the harbor, and attain a rate of 5 knots; caution is therefore necessary.

**Lifeboat.**—There is a coast-guard station with rocket life-saving apparatus at Port Patrick, where two lifeboats, one a motor lifeboat, are stationed.

**Black Head** is situated about 1½ miles northward of Port Patrick.

**Killantringan Light.**—A group flashing white light, 160 feet (48.8 m.) above water, visible 19 miles, is shown from a white cylin-

drical tower, 72 feet (21.9 m.) high, on Black Head. It is connected by telephone for life-saving purposes only.

**Fog signal.**—A siren is sounded at the lighthouse. See Light List.

**Radio.**—There is a radio station here that is available for weather bulletins on demand, for which a charge is made; call letters GPK.

**Craighead Tower** stands  $1\frac{1}{2}$  miles inland  $4\frac{1}{2}$  miles northward of Port Patrick; its base is 474 feet (144.5 m.) above high water, but it is almost hidden by trees. There is a conspicuous pillar on Wierston Hill, nearly  $1\frac{1}{2}$  miles northeastward of Craighead Tower, and very liable to be mistaken for it.

**Craig Laggan Beacon.**—At 7 miles northward of Black Head a masonry beacon, about 350 yards off Laggan Head, marks the southwestern extremity of a rocky plateau fringing the coast; the beacon, painted red and surmounted by a cross over a circular cage, stands on Craig Laggan, a ledge which covers at half tide. Some of the rocks of the plateau are above water, one of the most off-lying being The Ox, nearly  $11\frac{1}{2}$  miles northeastward from Craig Laggan Beacon and 400 yards offshore.

**Corsewall Point**, the northern extremity of the Rinns of Galloway, is about 2 miles northeastward of Laggan Head.

**Light.**—An alternating flashing white and red light, 112 feet (34.1 m.) above water, visible 16 miles, is shown from a white tower, 110 feet (33.5 m.) high, on Corsewall Point.

**Fog signal.**—A siren is sounded at the lighthouse. See Light List.

**Storm signals** are exhibited at the lighthouse, which is connected by telephone for life-saving purposes only.

**Milleur Point—Fog signal.**—At Milleur Point,  $2\frac{1}{4}$  miles eastward of Corsewall Point, there is a private fog horn for the use of the mail steamers.

**Tidal currents.**—The currents along the coast close inshore between the Mull of Galloway and Corsewall Point run at a greatest rate of 5 knots at springs, and there are overfalls or races off the Mull of Logan, Money Head, and Morroch Bay.

The southgoing current runs along the shore between Corsewall Point and the Mull of Galloway from 4 hours after high water until 2 hours before the next high water, and the northgoing current from 2 hours before to 4 hours after high water. Farther out the rate of the currents decreases until in mid-channel the rate is  $2\frac{1}{2}$  knots at springs, and the southgoing current runs from  $5\frac{1}{2}$  hours before until half an hour before high water, and the northgoing current from a quarter of an hour after high water until  $5\frac{1}{2}$  hours after. A little distance off the Mull of Galloway, therefore, the current is still run-

ning to the southward, while between the Mull and Burrow Head it is running westward. Hence the overfalls and races off the Mull.

**Loch Ryan** has its entrance ( $55^{\circ} 02' N.$ ,  $5^{\circ} 06' W.$ ) between Milleur and Finnart Points and extends southward  $7\frac{1}{2}$  miles, with an average breadth of from  $1\frac{1}{2}$  to 2 miles; it has good anchorage for vessels of moderate draft.

The western side of the entrance, forming the northern part of the Rinns, is comparatively low, as is also the head of the loch, but the eastern side of the entrance is high and bounded by precipitous cliffs.

**Depths.**—In the fairway of the entrance to Loch Ryan there is a depth of 48 to 56 feet (14.6 to 17.1 m.), which decreases gradually till a depth of 30 feet (9.1 m.) is attained  $1\frac{1}{2}$  miles within. Thence to about  $\frac{3}{4}$  mile northward of Cairn Point Lighthouse is a bar over which 21 feet (6.4 m.) can be carried at low water.

A pool with depths of from 30 to 54 feet (9.1 to 16.4 m.) extends from  $\frac{3}{4}$  mile northward to 1 mile southward of the lighthouse, with an average breadth of 300 yards. Southward of this pool the depth decreases gradually to 13 feet (4.0 m.) 200 yards from the East Pier at Stranraer.

**Lights.**—A fixed white light, 46 feet (14 m.) above water, visible 12 miles, is shown from a white tower, 50 feet (15.2 m.) high, on the low extremity of Cairn Point about  $3\frac{1}{2}$  miles within the entrance of the loch on the eastern side.

At Stranraer, at the head of the loch, a fixed white light, visible 6 miles, is shown from the end of the East Pier. A fixed green light is shown from the pierhead and a fixed red light from the southern end of the railroad station when a steamer is expected.

A fixed red light is shown at the head of the West Pier and a fixed green light on its inner head, both are visible 5 miles.

**Shoals.**—Forbes Shoal is a rocky patch with a depth of 15 feet (4.6 m.), situated distant about  $1\frac{1}{4}$  miles  $330^{\circ}$  from Cairn Point Lighthouse.

There are two patches with 19 and 18 feet (5.8 and 5.5 m.) water 800 and 1,300 yards, respectively, to the southward of this shoal.

**The Spit.**—The Scar is a low ridge of shingle mostly above high water, extending 700 yards from Kirkcolm Point, which is nearly opposite Cairn Point Lighthouse. The Spit, a sandy tongue, extends  $1\frac{1}{4}$  miles southeastward from it and also  $\frac{1}{2}$  mile toward Cairn Point Lighthouse, abreast of which the navigable channel is contracted to 400 yards with two shoal patches of 18 feet (5.5 m.) in it.

**The Wig.**—On the western side of The Spit is The Wig, a good anchorage for small vessels, having from 10 to 12 feet (3 to 4.3 m.) water, sand and mud bottom. It is the safest place with north-westerly gales, which send a heavy sea into the loch, even to the harbor.

**Light buoys, buoys.**—A red conical bell and light buoy, showing a group flashing white light is moored in 36 feet (11 m.) at 400 yards 40° from Milleur Point.

A red conical light buoy, showing a flashing white light, is moored on the southeastern extremity of The Spit, and a red conical buoy is moored in 14 feet (4.3 m.) on its eastern side, about 2 miles to the northward.

**Stranraer Harbor** (54° 54' N., 5° 02' W.), situated at the southwestern end of Loch Ryan, is inclosed between two converging piers, the width of the entrance being 270 yards. The east pier, on which is a railroad station, is 2,500 feet in length.

The depth in the entrance between the piers is 6 feet (1.8 m.), and the whole of the harbor is shallow with the exception of the dredged berthage, 800 feet in length by 70 feet in width, alongside the East Pier, which is dredged to 13 feet (4 m.), and the dredged area about 790 feet in length by 140 feet in width alongside the West Pier, which has a depth of about 5 feet (1.5 m.).

About three-fourths of the harbor dries and only about one-tenth of the total area is available for traffic.

There is additional berthing accommodation on the eastern side of the East Pier, where an area 360 feet long and 125 feet wide has been dredged to 13 feet (4.0 m.). In northerly or northwesterly gales the harbor is considerably disturbed.

**Storm signals** are shown.

**Tides.**—It is high water, full and change, at Stranraer at 11h. 43m.; springs rise 9½ feet, neaps 7½ feet, neaps range 6¼ feet. The tidal currents run generally in the line of the loch, but at the entrance the out-going current is deflected by Cairn Point to the westward past Milleur Point, and at Cairn Point it sets across the channel. The in-going current runs from 4 hours after high water until 2 hours before the next high water, and the out-going current from 2 hours before until 4 hours after high water; the greatest rate is 1¼ knots. At the head of the loch the currents are weak.

**Directions.**—Large vessels must give the western shore of Loch Ryan a berth of over 600 yards and should anchor before Lowset Farmhouse, which has a conspicuous white gable, on the hill above Lady Bay, bearing 255°.

Vessels of suitable draft proceeding up the loch can pass eastward of Forbes Shoal by keeping the Moat, a pyramidal grass-covered mound, just open westward of Cairn Point Lighthouse, bearing 154°; or, westward of the shoal by keeping Leffnoll Farm, a conspicuous group of buildings near the shore 1½ miles southward of Cairn Ryan, in range with the high-water line at the lighthouse bearing 147°. These marks, however, lead close to Forbes Shoal

and also to the 19 and 18 foot (5.8 and 5.5 m.) patches to the southward of it.

Pass Cairn Point Lighthouse at a distance of about 200 yards and bring the western extremity of Garry Point in range with the high-water line at the lighthouse, bearing  $340^{\circ}$ . To stay in the pool, anchor on this range in 7 fathoms (12.8 m.), when the manse, an isolated two-storied house to the southward of Cairn Ryan village, bears  $82^{\circ}$ .

To proceed up the loch, continue on the above range until Meikle Laight Farm, the highest group of houses visible to the northward on the eastern shore, is in range with a solitary barn above Cairn Ryan village, bearing  $2^{\circ}$ , which mark leads nearly to the East Pier at Stranraer, and anchorage may be obtained in a convenient depth.

At night, bring Cairn Point Light to bear  $154^{\circ}$  or  $147^{\circ}$  and steer for it, pass the light at a distance of about 200 yards, and gradually bring it to bear  $343^{\circ}$ ; then keep it on this bearing until the white light on the East Pier bears  $184^{\circ}$ , when steer for it.

If the light buoy is in position off The Spit, when it bears  $192^{\circ}$  the white light on the East Pier can be steered for.

When entering Loch Ryan during northwesterly gales the heaviest sea is experienced just outside the entrance, especially during the ebb current.

**The town** of Stranraer is situated on the shore southward of the harbor, and its population was 2,708 in 1921. It has stations of the Port Patrick and Wigtonshire Joint Railway, and mail steamers run daily, except Sundays, between Stranraer and Larne.

**Coal.**—There are usually about 300 to 400 tons of coal in stock at Stranraer, but a large quantity could be brought by rail from the Scotch mines with 6 days' notice.

There are two steam cranes on the East Pier, capable of lifting 5 tons and  $1\frac{1}{2}$  tons, respectively.

**Water.**—Water is supplied by hydrants to both piers and is fit for all purposes.

**Ballantrae.**—About  $4\frac{1}{2}$  miles northeastward of the entrance to Loch Ryan lies the small fishing village of Ballantrae ( $55^{\circ} 06' N.$ ,  $5^{\circ} 00' W.$ ), which may be recognized by two ancient towers, the higher one being round, while the southern and lower one is square. The bridge over Stinchar River lies at the back of the village, and is conspicuous from seaward.

There is a small pier with an elbow, within which a dozen herring boats find accommodation; this place is dry at low water and has about 8 feet (2.4 m.) at high water. During southwesterly winds there is a considerable reflux from the sea, though the entrance is open to the eastward.

There are depths of from 6 to 10 fathoms (11 to 18.3 m.) of water for about  $2\frac{1}{2}$  miles off Ballantrae, deepening rather suddenly to over 20 fathoms (36.6 m.).

**Life-saving apparatus.**—There is a coast-guard station with a rocket life-saving apparatus at Ballantrae.

**Storm signals** are exhibited from the flagstaff at the coast-guard station.

**Bennan Head**, rounded and salient, rises to a height of 329 feet (100.3 m.) close to the shore,  $2\frac{1}{4}$  miles northeastward of Ballantrae. There is a depth of from 7 to 5 fathoms (12.8 to 9.1 m.) close in to the head, but during the strength of the tidal currents at springs, when they attain a rate of about  $2\frac{1}{2}$  knots, a considerable race extends nearly 1 mile offshore, and should be avoided.

**The coast** from Bennan Head trends northeastward nearly 8 miles to Girvan; it is rocky, with no off-lying dangers, and there are depths of from 5 to 8 fathoms (9.1 to 14.6 m.) a mile off it, until near Girvan, where the water shoals, and there are depths of  $3\frac{1}{2}$  fathoms (6.4 m.) 1 mile, and of  $1\frac{1}{4}$  fathoms (2.3 m.) on Girvan Patch half a mile from the shore; therefore, unless bound to Girvan, give this coast a wide berth.

**Tidal currents.**—The in-going current through the North Channel, after passing the Mull of Cantyre, expands, and its north-eastern part strikes against Bennan Head, and splits, one part running northeastward, and the other southwestward along the shore, past the mouth of Loch Ryan, toward Corsewall Point, where it again joins the main current.

The current runs from Bennan Head toward Loch Ryan, at a rate of  $2\frac{1}{2}$  knots at springs, from 4 hours after high water until 2 hours before the next high water.

The north-going current out of the North Channel expands after passing Corsewall Point and meets the southwest-going current out of the Firth of Clyde off Bennan Head; the combined currents turn northwestward toward Sanda Island and the Mull of Cantyre.

**Girvan Harbor** ( $55^{\circ} 15' N.$ ,  $4^{\circ} 51' W.$ ) is at the mouth of Girvan River. There is a pier 410 feet long, alongside of which passenger steamers call in summer.

The south pier is 480 feet long and the breakwater 775 feet; both extend into depths of about 2 feet (0.6 m.). The inclosed area of the harbor is 14 acres, with depths throughout of from 3 to 4 feet (0.9 to 1.2 m.) at low water, and with quay frontage of about 620 feet.

**The depth** on the bar varies much with freshets and changes of wind, the bar sometimes disappearing altogether, and at others offering considerable obstruction.

**Light.**—A fixed red light 25 feet (7.6 m.) above water, visible 5 miles, is shown from a white tower on the South Pier Head at Girvan.

**Tides.**—It is high water, full and change, at Girvan at about 11h. 30m.; springs rise about 10 feet, neaps about 7 feet.

**The town** of Girvan is a summer resort, and it had a population of 8,474 in 1921. It has also considerable fisheries and a general export trade; coal fields are only 6 miles distant, and there is one coal transporter for loading vessels. The town is on the Glasgow and South Western Railway.

**Lifeboat.**—A lifeboat is stationed at Girvan.

**Ailsa Craig**, a remarkable rocky islet of columnar trap approaching in places to basalt, rises abruptly from the sea to the height of 1,097 feet (334.4 m.) at nearly 8 miles 330° from Bannan Head. It is circular in shape, about 1,200 yards in diameter, has a conical summit, and is very precipitous except on the northeastern side, where it slopes, and where only it is accessible. Here a landing may be effected in moderate weather, and the islet ascended by a zig-zag path. The islet is a breeding place for sea fowl, gulls, puffins, solan geese, etc.; there are also goats and rabbits.

A sea wall is being built, with a pier in connection, where a moderate-sized steamer can lie alongside, but there are no landing steps. There is another pier where steamboats can go alongside, with ordinary caution, at all states of the tide.

**Caution—Night gun practice.**—Mariners are cautioned that night firing occasionally takes place in the neighborhood of Ailsa Craig, and a careful watch should be kept for these maneuvers.

**Light.**—A group flashing white light, 60 feet (18.2 m.) above water, visible 13 miles, is shown from a yellow brick tower, 35 feet (10.7 m.) high, on the spit on the eastern side of Ailsa Craig.

**Fog signals.**—There are two fog-signal stations on Ailsa Craig, one near the southern, the other near the northern end. See Light List.

**The coast** from Girvan Harbor trends northward nearly 5 miles to Turnberry Point.

**Brest Rocks** extend 1,600 yards offshore, about 3½ miles from Girvan and 1 mile southward of Turnberry Point.

**Beacon.**—A red iron pillar with cage stands on the inner end of Brest Rocks, but, as the rocks extend about 600 yards outside the beacon, caution is necessary. The land about Denure Harbor open of Turnberry Point leads northwestward of the rocks.

**Turnberry Point**, though low, is conspicuous from its projection. On its northeastern side are the ruins of a castle; near them is the lighthouse, and on the summit of the highest point stands a cairn.

Pladda Island Lighthouse, at the southern end of Arran Island, bears 303°, distant  $11\frac{1}{4}$  miles from the point, the entrance to the Firth of Clyde lying between.

**Light.**—A flashing white light, 96 feet (29.3 m.) above water, visible 15 miles, is shown from a white tower, 64 feet (19.5 m.) high, on Turnberry Point. It is connected by telephone for life-saving purposes only.

**Gun-practice danger area.**—The limits are as charted, namely, northwestward of the flagstaff situated northeastward of Turnberry Point and due west of the flagstaff at Doon Hill, extending to a distance of 3 miles offshore.

The signals that the area is closed are: Red flags hoisted at the following places along the cliff—(a) Flagstaff near Turnberry Point, (b) flagstaff just north of Milton village. These signals will be hoisted not less than 1 hour before practice for the day, provided that when practice is to commence at or before sunrise the signals will be hoisted before sunset on the previous day and remain up all night.

Notice that firing will take place is given to the coast guards, police, postmasters at Milton and Girvan, and the harbor masters at Girvan and Ayr.

**The coast** from Turnberry Point trends northeastward for  $5\frac{3}{4}$  miles to Denure Harbor,  $2\frac{1}{4}$  miles beyond which are the Heads of Ayr. The land falls back between Turnberry Point and Denure Harbor, forming two small bays divided by Barwhin Point.

**Maiden Rocks.**—In the western and smaller of the two bays are the Maiden Rocks, which are above water, and Keown Rock, which covers at half tide; both are within the line joining Turnberry and Barwhin Points.

**Maidens Harbor.**—Within the Maiden Rocks or Islets, in South Gullet, the southern bight of the coast, is a pier which has recently been lengthened to about 470 feet, and to further protect the inclosed space two detached shelter breakwaters have been built on the ledges to a height of about 4 feet (1.2 m.) above high water, and extending northeastward of the pier. The inner one commences close eastward of the pier, and is 280 feet in length; the outer one is 165 feet in length nearly east and west, and there is a space between them about 20 feet wide. It is locally known as Maidens Harbor, and is used by fishing craft; the greater portion dries, but there is a pool with 7 feet (2.1 m.) water in which the vessels lie. It is fully occupied when all the boats are in.

**Culzean Bay**, the eastern of the two bays divided by Barwhin Point, is clear off-lying shoals, the 5-fathom (9.1 m.) curve being about 800 yards offshore. On the southern side of the bay Cluzean



Castle stands on the edge of a cliff, and is surrounded by woods and undulating grassy parks.

**Denure Harbor**, formed of stone piers, now in a ruinous condition, has a depth of about 6 feet (1.8 m.) at high water, and is only frequented by fishing boats. A small tower marks the southwestern side of the entrance.

**The Heads of Ayr** are a conspicuous headland, consisting of a vertical cliff terminating toward its base in steep grassy slopes, with comparatively low land on either side. The Heads lie about 3 miles southwestward from the entrance to Ayr Harbor, the intervening land falling back to the southward, forming a bight within which the ground is foul.

About 1 mile eastward of the Heads are the lofty ruins of Greenan Castle, standing on the edge of a cliff.

**Ayr Bay** lies between the Heads of Ayr and Troon. There are many shoals in the bay, and great care should be taken in approaching Ayr Harbor.

**Dangers.**—A rocky patch with 4 fathoms (7.3 m.) lies about  $\frac{3}{4}$  mile  $0^\circ$  from the Heads of Ayr.

A rocky patch with  $4\frac{1}{2}$  fathoms (8.2 m.) is situated about  $1\frac{1}{4}$  miles northward of Devils Point, and between this rock and Devils Point the ground is foul.

**Ayr Harbor** is at the mouth of the Ayr River. The entrance, formed between a breakwater and two piers, is about 200 feet wide, the principal protection from northerly gales being afforded by the breakwater on its northern side.

After heavy rains very strong freshets come down the river and tend to sheer vessels toward the northern pier; in winter, after the breaking up of hard frost, the ice on the ebb has swept vessels out to sea. Southwesterly winds cause a swell at the entrance.

**Depths.**—There is a depth of 15 feet (4.6 m.) at low water in the channel into Ayr Harbor, and that depth extends also a considerable way up the river.

**St. Nicholas Rocks**, which dry 2 feet (0.6 m.), lie 200 yards southwestward of the South Pier Head.

Outer St. Nicholas Rocks, marked foul ground on the plan, consist of two patches, the outer one, with 2 feet (0.6 m.) water, lying 600 yards  $242^\circ$  from the South Pier Head.

The fixed red light on the south pier end covers St. Nicholas Rocks and the greater part of Outer St. Nicholas Rocks.

**Buoy.**—A red conical buoy is moored 800 yards  $262^\circ$  from the North Pier Light.

**Range lights—Front.**—A fixed red light is exhibited 33 feet (10 m.) above water from a red iron tower near the dock entrance on the northern side of the harbor.

**Rear.**—A fixed white light is exhibited at 58 feet (17.7 m.) above water from a white stone lighthouse, situated about 150 yards 98° from the front light, and should be seen from a distance of 10 miles.

These lights in range, 98°, lead over the bar in 12 feet (3.7 m.) water.

**Light—South Pier.**—An occulting white light is exhibited 24 feet (7.3 m.) above water from a red iron light tower on the outer end of the South Pier.

A fixed red light, visible over St. Nicholas Rocks, is shown from the same tower. See Light List.

**North Pier.**—A flashing green light, visible 5 miles, is shown, 29 feet (8.8 m.) above water, from the end of the North Pier.

**Fog signal.**—A fog signal is sounded from the outer end of the South Pier. See Light List.

**Tugs—Pilots.**—A steam tug is kept ready, and in her, or in boats, pilots go out to vessels making the pilot signal.

**Signals.**—Two balls, placed vertically by day, or two red lights, placed vertically at night, are shown from the pilot's flagstaff when the harbor channel is obstructed and vessels are prohibited from entering.

**Tidal basin.**—On the northern side of the harbor, just within the entrance, is a tidal basin 6 acres in extent, 60 feet wide in the entrance with a depth on the sill of  $11\frac{3}{4}$  feet (3.5 m.), and inside a uniform depth of about 15 feet (4.6 m.) at low-water springs.

**Tides.**—It is high water, full and change, at Ayr Harbor, at 11 h. 50 m.; springs rise  $8\frac{3}{4}$  feet, neaps  $7\frac{1}{4}$  feet. A flag is hoisted in the daytime at half flood and is not hauled down until half ebb.

Fresh southerly winds raise, while northerly and northeasterly winds lower the water level here, as well as in other parts of the Firth of Clyde.

**The town of Ayr,** which is the county town of Ayrshire, stands at the mouth of the Ayr River; it includes the suburbs of Newton-on-Ayr and Wallace Town, and the population of the burgh was 38,911 in 1921. The spire of the town's buildings is 226 feet (67.9 m.) high and conspicuous.

The Glasgow & South Western Railway passes through the town and has sidings alongside the tidal basin and principal quays. There is frequent communication with Glasgow and Belfast by steamer.

**Trade.**—The chief export is coal and the chief imports are grain and timber. In 1918, 5,977 vessels, with an aggregate tonnage of 875,535 tons, entered the port.

**Repairs** can be effected to hull, but only slight repairs to machinery.

**Coal** is supplied direct from the pit. Vessels coal alongside a wharf in from 11 to 13 feet (3.4 to 4 m.) at low-water springs and may have the assistance of a steam crane.

**Supplies.**—All kinds of supplies are obtainable. Water for drinking and boiler purposes is abundant.

**Hospital.**—In case of need the Ayr County Hospital is available for seamen.

**Lifeboat.**—There is a lifeboat and also a rocket life-saving apparatus at Ayr.

The coast trends northward from Ayr Harbor to Troon Harbor, a distance of 5 miles, forming a bay, in and off which are the following shoals:

**Saltpan Patches** are two in number; the outer and shallower patch with  $2\frac{1}{4}$  fathoms (4 m.) water, lies  $1\frac{1}{2}$  miles  $307^\circ$  from Ayr Harbor entrance; the inner patch, with 3 fathoms (5.5 m.) water, lies  $1\frac{1}{4}$  miles  $324^\circ$  from the harbor entrance.

The high spire of Ayr open southward of the South Pier Head,  $119^\circ$ , leads southwestward of these patches.

**Saltpan Spit**, with depths of less than  $1\frac{1}{4}$  fathoms (2.2 m.), extends northwestward  $1\frac{1}{2}$  miles from Bankfield Point, which is situated about  $1\frac{1}{2}$  miles northeastward of Ayr Harbor entrance.

**Rock.**—A rock stands on an extension of the shoal ground surrounding Saltpan Patches and spit; it is 300 yards in length northeast and southwest, and 100 yards broad, within the 5-fathom (9.1 m.) curve; the shoalest spot of  $2\frac{1}{4}$  fathoms (4 m.) lies 1 mile  $309^\circ$  from the outer Saltpan Patch; there may be less water in this portion of the bay than is charted, and the bottom is irregular.

**Black Rocks**, situated about 3 miles northward of Ayr Harbor entrance, extend southwestward about 1,600 yards from the shore.

**Lady Isle**,  $4\frac{1}{2}$  miles northwestward from Ayr, is of small extent, and has two towers; it is surrounded by shoal ground, which in some places extends from 600 to 800 yards off it.

**Light.**—A group flashing white light, 63 feet (19.2 m.) above water, visible 12 miles, is shown from the higher of the two towers on Lady Isle. The light is unwatched.

**Bank.**—At  $\frac{3}{4}$  mile eastward of Lady Isle there is a detached bank,  $\frac{1}{2}$  mile long, having a depth of  $2\frac{1}{2}$  fathoms (4.6 m.) on its southern end, with 7 fathoms (12.8 m.) between it and Lady Isle, and from 7 to 11 fathoms (12.8 to 20.1 m.) between it and the shore.

Kilwinning Tower, in range with the outer southern light beacon at Irvine,  $1^\circ$ , leads eastward of this bank.

**Wreck—Buoy.**—The wreck of a steamer lies stranded 1,500 yards  $45^\circ$  from Lady Isle Lighthouse. A green conical buoy is moored close northward of the wreck.

**Ayr Bay—Shoals.**—A shoal of  $4\frac{3}{4}$  fathoms (8.5 m.) lies 2,650 yards  $132^\circ$  from Lady Isle Lighthouse.

The whole area to the eastward and southeastward of Lady Isle shows exceedingly irregular depths.

**Troon Rock**, with  $2\frac{3}{4}$  fathoms (4.9 m.) water, lies 2,200 yards  $269^\circ$  from Troon Harbor West Pier Lighthouse.

**Troon Harbor** ( $55^\circ 33' N.$ ,  $4^\circ 41' W.$ ), which is more easy of access than any other harbor on the coast of Ayrshire, is artificially formed on the eastern side of the projecting point dividing Irvine and Ayr Bays. A pier has been run out for 1,000 yards, inclosing a space between it and the projecting point. This space is divided into an Inner and an Outer Harbor; in the Outer Harbor there is excellent quayage for discharging or loading cargoes, sheltered from northwesterly winds by the west pier, which overlaps the east pier, and within which vessels of moderate draft lie in security.

Vessels from infected ports must obtain pratique before entering the harbor.

Special by-laws are in force with reference to vessels carrying carbide of calcium.

**Depths.**—The depth of water at the entrance to the harbor is 16 feet (4.9 m.) at low water springs, and the general depth in the Outer Harbor is from 14 to 7 feet (4.3 to 2.1 m.). There is a depth of 15 to 19 feet (4.6 to 5.8 m.) alongside in the tidal basin, and of 19 feet (5.8 m.) alongside the west pier for a length of 300 feet. There are also several berths alongside the quays available for discharging and loading, with from 6 to 11 feet (1.8 to 3.4 m.) water. The greater part of the Inner Harbor, which is mainly a timber basin, dries at low water; it has an entrance 49 feet wide.

**Lights.**—A fixed white light with red sector, 35 feet (10.7 m.) above water, visible 6 miles, is shown from a white stone tower, 25 feet (7.6 m.) high, on the head of West Pier.

A fixed green light with white sector, 22 feet (6.7 m.) above water, visible 5 miles, is shown from a post on a dolphin about 15 yards southeastward of West Pier Light.

A fixed red light, 19 feet (5.8 m.) above water, visible 5 miles, is shown from the outer end of East Pier.

**Fog signal.**—A fog signal is sounded on the West Pier. See Light List.

**Signals.**—Two black balls, placed vertically, by day, or two red lights, placed vertically, at night, shown from the flagstaff at the pilot's house indicate that the harbor is blocked, and that entry or exit is prohibited.

**Buoys.**—Mill Rock,  $\frac{1}{2}$  mile northeastward of Troon West Pier, is of small extent, dries 1 foot (0.3 m.), and is marked on its southern side by a black can buoy.

The northern edge of the shoal and foul ground lying westward of Troon Point ( $55^{\circ} 33' \text{ N.}$ ,  $4^{\circ} 41' \text{ W.}$ ) is marked by a red buoy, moored in 3 fathoms (5.5 m.), nearly 400 yards  $268^{\circ}$  from Troon West Pier Head.

**Shoal.**—A shoal, with  $4\frac{1}{4}$  fathoms (7.8 m.) of water lies 1,200 yards  $321^{\circ}$  from Troon Harbor West Pier Head.

**Tidal basin.**—The tidal basin is 370 feet long, 260 feet wide, and the entrance is 40 feet wide with a depth of 23 feet (7 m.) over the sill at high water springs, there being depths of 15 to 20 feet (4.6 to 6.1 m.) at low water within the basin.

**Tides.**—It is high water, full and change, at Troon at 11h. 50m.; springs rise 10 feet; neaps  $7\frac{1}{2}$  feet.

**Tugs.**—Steam tugs are always in readiness, and may be obtained by making the signal by day or by showing two lights at night.

**Directions.**—In approaching Troon Harbor from the southward, avoid the rocky ledge which fringes the western side of the retaining works, Kilwinning Tower in range with the outer southern light beacon of Irvine, bearing  $1^{\circ}$ , leading westward of it. Leave the red buoy, westward of the west pierhead, on the starboard hand, whence steer to round the west pierhead.

**The town of Troon** is a summer resort, neatly built, and contained 9,474 inhabitants in 1921, but this number is greatly increased by visitors in summer. There is communication by rail, telegraph, and telephone with the systems of the country, and by steamers frequently with many British, Irish, and foreign ports. There is a hospital for seamen.

**Coal and supplies.**—Coal can be obtained in any quantity alongside the quays and in the basin, where each berth has a 30-ton steam crane. Stores of all descriptions can also be supplied, and there is every facility for loading or discharging cargo, both piers and the quays being well furnished with railroad sidings. Any amount of fuel oil may be obtained.

**Docks.**—At Troon there are two dry docks and a large yard for the building and repair of iron and wooden vessels, machinery, and boilers. See Appendix.

**Lifeboat.**—A lifeboat is stationed at Troon.

**Trade.**—The chief exports are coal and pig iron, and the imports timber, iron, sulphur, chrome ores, and limestone. In 1918, 1,439 vessels, with an aggregate tonnage of 192,358 tons, entered the port.

**The coast** curves northward and northwestward from Troon to Saltcoats, a distance of 6 miles, falling back to the eastward nearly 2 miles and forming Irvine Bay.

**Lappoch Rock**, about midway between the entrance to Troon Harbor and the outer southern light beacon of Irvine Harbor, dries

2 feet (0.6 m.) and is steep-to on its northern side. The spire of Ayr open of Troon Point leads westward of the rock.

**Beacon.**—A red stone tower surmounted by a ball stands on Lappoch Rock.

**Irvine Harbor** ( $55^{\circ} 36' N.$ ,  $4^{\circ} 42' W.$ ),  $3\frac{1}{4}$  miles northward of Troon Harbor entrance, at the confluence of the Irvine and Garnock Rivers, is well protected from all winds and is suitable for vessels not exceeding 16 feet (4.9 m.) draft. Its quays and wharves, which are on the southern side and commence about 700 yards from the entrance, are 1,935 feet long, well provided with steam cranes, railroad sidings, and conveniences for speedy loading and discharging of cargo.

On the southern side of the harbor about 600 yards from the outer light beacon is a blank protecting white wall with a lookout for pilots, and a flagstaff for tidal signals at its outer end.

**Depths.**—The depth on the bar is from 16 to  $16\frac{1}{2}$  feet (4.9 to 5.0 m.) at high-water springs, and 14 feet (4.3 m.) at neaps, the channel being marked by perches on either side; the depth alongside the wharf is from 7 to 15 feet (2.1 to 4.6 m.) at low water, mud and sand bottom. The bar, however, is considerably affected by the wind, fresh southerly winds increasing and northerly winds retarding and decreasing the average depth; also freshets from the river sometimes reduce the depth by a foot or more. Generally a lee-going current sets across the entrance during northerly or southerly winds, so it is not advisable for vessels to attempt to enter without a pilot or local knowledge.

**Lights.**—A flashing violet light, 26 feet (7.9 m.) above water, visible 6 miles, is shown from an iron-framework beacon on the southern side of the entrance to Irvine Harbor.

A flashing white light, 30 feet (9.1 m.) above water, visible 6 miles, is shown from a wooden-pile beacon on the northern side of the entrance to Irvine Harbor, 200 yards northward of the light beacon on the southern side of the entrance.

**Range lights—Inner.**—A fixed red light, 50 feet (15.2 m.) above water, visible 5 miles, is shown from a mast on the southern side of the river.

**Outer.**—A fixed green light, 33 feet (10 m.) above water, visible 5 miles, is shown from a mast about 500 yards inside the entrance to the harbor.

The lights in range,  $53^{\circ}$ , lead over the bar and into the middle of the entrance of the river until past the beacon lights.

Perches mark both sides of the river above the light beacons up to the wharves.

**Signals.**—Two black balls by day or two red lights at night indicate that vessels must not enter or leave the harbor without permission.

**Tidal signals.**—Automatic tide signals, indicating the depth of water, with smooth sea, in mid-channel at the entrance to Irvine Harbor, are exhibited from a tower, surmounted by a mast, situated about 40 yards southward of the outer leading light mast.

The night signals are lights, placed vertically in one line, shown from the tower, and the day signals are balls, placed vertically in two lines, at the yardarms of a small yard on the mast.

Depth in feet	Day signal	Night signal	Depth in feet	Day signal	Night signal
7 (2.1 m.)...	1 ball...	1 green light.	13 (4 m.)...	7 balls...	1 green under 2 white lights.
8 (2.4 m.)...	2 balls...	1 red light.	14 (4.3 m.)...	8 balls...	1 red under 2 white lights.
9 (2.7 m.)...	3 balls...	1 white light.	15 (4.6 m.)...	9 balls...	3 white lights.
10 (3.1 m.)...	4 balls...	1 green under 1 white light.	16 (4.9 m.)...	10 balls...	1 green under 3 white lights.
11 (3.4 m.)...	5 balls...	1 red under 1 white light.	17 (5.2 m.)...	11 balls...	1 red under 3 white lights.
12 (3.7 m.)...	6 balls...	2 white lights.	18 (5.5 m.)...	12 balls...	4 white lights.

**Tugs—Pilots.**—A steam tug is kept in readiness between half flood and half ebb, and can be obtained by hoisting the pilot jack by day or by showing two lights at night. Pilots are in attendance.

**Anchorage.**—The best anchorage (55° 36' N., 4° 43' W.) outside the bar is a little northward of the entrance in from 8 to 12 fathoms (14.6 to 22 m.), good holding ground; the position, however, is very open, and vessels should anchor here only in fine weather or with offshore winds.

**Explosives.**—Special by-laws are in force with regard to explosives. Vessels not under the control of Nobel's Explosives Co. must not anchor in the fairway of Garnock River off the Nobel Wharf.

**The town of Irvine** lies on the Irvine River, about 11¼ miles inland, and contained 7,534 inhabitants in 1921. It has chemical works, foundries, grain stores, etc. In thick weather the iron foundries to the northward of the town reflect a strong light in the sky, but a flicker prevents this being mistaken for the harbor lights.

**Coal and supplies.**—Coal in any quantity can be supplied with a day's notice and can be put on board alongside the wharves by steam crane. Ordinary supplies can be obtained.

**Repairs.**—There is no dock or slip, but repairs can be effected, as there is a shipbuilding yard.

**Trade.**—The chief exports are coal, fire-clay goods, pig iron, and chemicals; the imports are grain, salt, slates, limestone, ores, and timber. Steam vessels call frequently, bound to and from Dublin, Belfast, Glasgow, Liverpool, and Fleetwood.

**Saltcoats Harbor**, 3½ miles northwestward of Irvine, is formed by a long pier, based on a ridge of rocks, extending southwestward

from the shore, with a crosshead 90 yards from its outer end. A half-tide reef, the outer end of which is marked by a perch, extends from the pier. On the northern side of the harbor is a cluster of rocks, which uncovers at low water and opposite the crosshead of the pier is the beginning of an uncompleted pier.

At low-water springs the water ebbs out to the crosshead. There are a few feet of water between it and the end of the pier, but there is no protection outside the crosshead, especially with south to west winds, when the swell is considerable.

**Directions.**—To clear the northern point at the entrance to the harbor, keep the Town Hall Steeple in range with the end of the crosshead. The best place for temporary anchorage is with the pier-head in range with the church, the largest building at the northern end of the town; it has no steeple.

**South Bay.**—The coast between Saltcoats and Ardrossan, a distance of  $\frac{3}{4}$  mile, forms South Bay, a small indentation, which affords no anchorage and is quite open.

**Ardrossan Harbor** ( $55^{\circ} 39' N.$ ,  $4^{\circ} 50' W.$ ) is on the northern side of a low projecting point, southwestward of which reefs extend for nearly 600 yards. The harbor is of artificial formation, and the entrance, 110 yards wide, is between the outer or Lighthouse Pier, extending northward from the low projecting point on the southern side, and the breakwater, which, commencing from Long Craig rocks, 550 yards northeastward from the pier head, extends southwestward about 120 yards, and then southward 330 yards, terminating on Grinan Rock.

**Depths.**—There is a least depth of 20 feet (6.1 m.) at low water in the fairway of the entrance to the harbor, and the general depth within the breakwater varies from 18 to 10 feet (5.5 m. to 3.1 m.).

**Tidal basins and wet docks.**—Within the Lighthouse Pier are Winton and Montgomerie Piers; between the Lighthouse and Winton Piers is the Old Tidal Basin leading into the Old Wet Dock; and between Winton and Montgomerie Piers are Eglinton Tidal Basin and Eglinton Wet Dock. Alongside the heads of the three piers there are berths for steamers with 13 to 18 feet (4 to 5.5 m.) water, and all the piers and docks are supplied with cranes and hoists for loading and unloading, and railroad sidings. Of the cranes, one is of 40 tons and one of 30 tons capacity and three of 20 tons; there are several smaller.

The Old Tidal Basin has 837 feet of quayage and depths of 9 feet (2.7 m.) at low water springs, but the space between Jerrys and Winton Piers is shoal and rocky.

Eglinton Tidal Basin has an area of  $4\frac{3}{4}$  acres and 1,740 feet length of quayage, with a general depth of 18 feet (5.5 m.) at low



water springs. A greater depth can be maintained by closing the dock gates.

**Tugs—Pilots.**—There are steam tugs at Ardrossan and pilots are available, a constant lookout being maintained from the pilot house, which overlooks the Lighthouse Pier.

**Lights.**—An occulting white light with red sector, 35 feet (10.7 m.) above water, visible 10 miles, is shown from a white tower, 23 feet (7 m.) high, on the northern extremity of the Lighthouse Pier,

A fixed white light with red sector, 28 feet (8.5 m.) above water, visible 6 miles, is shown from a gantry on the southern extremity of the breakwater. Owing to the brilliancy of the lights of the town it is difficult to recognize this light when in the red sector.

Two fixed green lights, 19 and 22 feet (5.8 and 6.7 m.), respectively, above water, visible 5 miles, are shown from a post on the northern extremity of Winton Pier.

**Fog signal.**—A fog signal is sounded near the pilot house. See Light List.

**Harbor signals.**—Two balls, placed vertically, by day, or two red lights, placed vertically, at night, are exhibited from a flagstaff at the pilot house and also from Montgomerie Pier when vessels should not enter the harbor.

**Campbell Rock**, which dries 2 feet (0.6 m.), lies 450 yards south-westward from the southern point of the retaining wall of the harbor works and just outside the western end of Castle Craigs, a ledge of rocks extending from the same point.

**Eagle Rock**, which nearly covers at high water, lies 281 yards from the middle of the retaining wall of the harbor works; between it and the shore are ledges of low water rocks, and southward of it a rock awash, besides several patches of 16 and 17 feet (4.9 m. and 5.2 m.).

Both Campbell and Eagle Rocks must be guarded against when approaching the harbor from the southward, and should be given a berth of not less than 400 yards.

The tower of Seafield House, in the northern part of Ardrossan, in range with the northwestern extremity of the Lighthouse Pier  $26^{\circ}$ , leads northwestward of these rocks and patches.

At night the red sector of the Lighthouse Pier Light covers these shoals.

**Horse Island—Beacons.**—Horse Island ( $55^{\circ} 39' N.$ ,  $4^{\circ} 50' W.$ ),  $3\frac{1}{4}$  cables long northwest and southeast, partially covered with grass and only a few feet above water, lies half a mile northwestward of Ardrossan Lighthouse Pier. On the southern point is a square stone beacon, with three windows on either side, and from this point Horse Island Shelves, rocky spurs, extend westward and

southwestward 300 yards; an iron beacon with globe, 23 feet (7 m.) high, stands near their southwestern end. To the southward of the shelves the bottom is rocky and uneven, a path of 17 feet (5.2 m.) lying 650 yards southward of the beacon on the island. A shoal of 21 feet (6.4 m.) lies 700 yards 262° from the same beacon.

The island is connected to the shore to the northeastward by a bar with a greatest depth of 6 feet (1.8 m.), but there are several isolated rocks between the southern end of the island and the mainland; though the rocks are mostly marked by perches or buoys, the passages between them are only available for small vessels with local knowledge.

**West Grinan Rock**, westward, 250 yards from the southern end of the breakwater, is about 100 yards in extent, and dries 2 feet (0.6 m.).

Half way between it and the breakwater in a northeasterly direction is a 4-foot (1.2 m.) rock and 100 yards northward from the 4-foot (1.2 m.) rock is a rock with 8 to 11 feet (2.4 to 3.4 m.) water.

The red sector of the breakwater light covers these shoals as well as the shoals southward of Horse Island.

**Buoys.**—A black conical buoy is moored on the southern side of West Grinan Rock and a black can buoy is moored on the northern side of the rock.

**Tides.**—It is high water, full and change, at Ardrossan at 11h. 49m.; springs rise 10 feet, neaps  $7\frac{1}{2}$  feet; neaps range  $4\frac{3}{4}$  feet.

**Directions.**—In approaching Ardrossan Harbor by day, bring the turret of the schoolhouse in the northeastern part of Ardrossan in range with the northern end of the Lighthouse Pier, bearing 58°; keep this mark on until about 400 yards from the entrance. Then proceed very slowly midway between the Lighthouse Pier and the breakwater.

To enter the Old Tidal Basin, run a hawser from the starboard bow to the Lighthouse Pier, and round the pier with the helm hard aport. To enter the Eglinton Tidal Basin, run the hawser from the starboard bow to the northeastern end of Winton Pier.

At night approach with the occulting light on the end of the Lighthouse Pier, bearing about 58°, keeping in the white sector of the light on the southern end of the breakwater, and round the pier-head at the distance of about 20 yards, using a hawser as above directed, but it is not prudent for a vessel to approach Ardrossan Harbor at night without a pilot or local knowledge.

The size of vessels using Ardrossan Harbor is limited not only by the depth but also by the limited area of the harbor. Entrance to the tidal basin can only be made about the time of high water, and delay in entering and leaving is often caused by bad weather. Ves-

sels anchored off the harbor and forced to leave in bad weather seek refuge across the Firth of Clyde in Lamlash Harbor.

**The town.**—Ardrossan is a seaport and summer resort, and its population was 16,517 in 1921. It has communication by the Glasgow and Southwestern and Caledonian Railroads, by telegraph and telephone, and by steam vessels, with Belfast and the Isle of Arran.

**Trade.**—The chief exports are coal and pig iron, and the imports, iron ore, grain, timber, and limestone. In 1918, 4,651 vessels, with an aggregate tonnage of 881,417 tons, entered the port.

**Dry dock.**—On the southern side of the Old Wet Dock is a dry dock with a marine railway close to it.

**Repairs.**—Moderate repairs can be effected to hull or machinery at Ardrossan.

**Coal.**—An unlimited supply of coal can be obtained at short notice from the pits in the vicinity. Vessels can coal in the wet docks or in the tidal basins.

**Fuel oil.**—Fuel oil is laid on at Montgomerie Pier.

**Supplies.**—Supplies of all sorts are obtainable, and water from hydrants at various places round the docks.

**Lifeboat.**—A lifeboat and rocket apparatus are stationed at Ardrossan.

**Storm signals** are exhibited from the flagstaff at Lighthouse Pier.

**Farland Head** ( $55^{\circ} 42' N.$ ,  $4^{\circ} 54' W.$ ), at the entrance to the narrow waters of the Firth of Clyde, bears  $323^{\circ}$ , distant  $4\frac{1}{4}$  miles from Ardrossan Lighthouse Pier, Horse Island lying outside this line; the intervening coast is generally sandy, with occasional steep braes, farmhouses, and patches of wood; the 5-fathoms (9.1 m.) curve being about  $\frac{1}{2}$  mile offshore, except at 1 mile southward of the head, where there are depths of 4 fathoms (7.3 m.) rock, a mile offshore.

Farland Head is steep-to on its western side, but 1 mile northward of it shoal water begins to extend from the mainland, and gradually narrows the channel between it and Great Cumbrae Island to less than 1,000 yards. Close northward of the head is the ruin of Portin-cross Castle, which stands on a shelving point with a well-wooded background rising somewhat abruptly behind it. On the northeastern side of the castle is a good cove where fishing boats obtain shelter.

**Tidal currents.**—The current runs northeastward along the coast from Bennan Head to Farland Head, at a greatest rate of  $2\frac{1}{2}$  knots at springs, from about  $4\frac{1}{2}$  hours after high water till  $1\frac{1}{2}$  hours before the next high water, and southwestward from  $1\frac{1}{2}$  hours before till  $4\frac{1}{2}$  hours after high water, at a similar rate.

In the bays, especially the deep bights between the Heads of Ayr and Ardrossan, the currents are weak, but the rate increases toward Farland Head.

**Mull of Cantyre.**—The peninsula of Cantyre, situated between the Firth of Clyde and the Atlantic Ocean, forms the southern part of Argyllshire, and is connected with the more northern portion of the county by the narrow isthmus separating East and West Lochs Tarbert. It is 37 miles long, with an average breadth of 7 miles, and a diversified surface. The southwestern and most salient point of the peninsula is a high rocky headland known as the Mull of Cantyre, from which Tor Point, on the northeastern coast of Ireland, bears  $236^{\circ}$ , distant 11 miles.

The Mull is bold and steep-to; but a very strong race is sometimes caused to the southward and southwestward of it by a southerly gale opposing the south-going tidal current.

**Light.**—A group flashing white light, 297 feet (90.5 m.) above water, visible 24 miles, is shown from a white tower, 38 feet (11.6 m.) high, on the summit of a cliff about  $\frac{3}{4}$  mile northward of the Mull. The light is often obscured by the haze over the high land.

**Fog signal.**—A fog signal is sounded about 1,500 yards southward of the lighthouse. See Light List.

**Storm signals** are exhibited from the flagstaff near the lighthouse, which is connected by telephone for life-saving purposes only.

**Rathlin Island** is on the western or Irish side of the North Channel. Altacarry Head, its northeastern point, bearing  $268^{\circ}$ , distant  $12\frac{1}{2}$  miles from Mull of Cantyre Lighthouse.

**Rathlin East Light.**—A group flashing white light with red sector, 243 feet (74.1 m.) above water, visible 22 miles, is shown from a white circular tower, 88 feet (26.8 m.) high, with a red belt under the gallery, on Altacarry Head, the northeastern point of Rathlin Island.

**Rathlin West Light.**—A flashing red light, 204 feet (62.2 m.) above water, visible 20 miles, is shown from a point near the western end of the island, about  $\frac{1}{2}$  mile northward of Bull Point.

**Rue Point Light.**—A group flashing white light, 52 feet (15.8 m.) above water, visible 12 miles, is shown from an octagonal concrete tower, 35 feet (10.7 m.) high, with black and white bands, on the southern extremity of Rue Point.

**Fog signals.**—Fog signals are sounded from each lighthouse. See Light List.

**Danger signal.**—When a vessel is seen standing into danger, the signal flags J. D. of the international code will be hoisted at Rathlin East Light and a signal exploded and repeated until observed.

The coast from the Mull of Cantyre trends southeastward  $1\frac{1}{2}$  miles to Deas Point, the southern extremity of Cantyre Peninsula and is bold and rocky. There is a tidal race at times off the point.

**Carskey Bay.**—The coast trends eastward  $5\frac{1}{2}$  miles from Deas Point to Barley Point, and forms a shallow indentation, in the middle of which is Carskey Bay, where good shelter may be obtained in 4 to 5 fathoms (7.3 to 9.1 m.) from northwesterly winds; as the anchorage is clear and only slightly affected by the tidal stream, it is a good place to await the turn of the stream when rounding the Mull. Both points of Carskey Bay are fringed with rocks; Carskey Rocks extend nearly 400 yards on the western side, while the ledge off Gartvaigh Head, on the eastern side, is continuous as far as Dunaverty Point, 1 mile to the eastward, where the rocks dry 2 feet (0.6 m.) 200 yards offshore.

Carskey House, large, with two stories, lies within the western side of the bay, and Keill House, with a tower, is situated at Keill village, on the eastern side of Gartvaigh Head; both are conspicuous.

There are two noticeable dark mounds at Dunaverty Point, on the southern of which there is a flagstaff.

**Lifeboat.**—On the eastern side of Dunaverty Point ( $55^{\circ} 18' N.$ ,  $5^{\circ} 38' W.$ ) are a small cove and Southend Village, where a lifeboat and a rocket apparatus are stationed.

**Caution.**—When working westward with a west-going tide, caution is needed after passing Sanda Island, as the inshore stream sets toward Deas Point, and the steep land eastward of it causes the wind to fail.

**Rock.**—A rock with 1 foot (0.3 m.) water lies about 600 yards southeastward of Dunaverty Point and 400 yards offshore; there is a depth of 5 fathoms (9.1 m.) close outside, and of one fathom (1.8 m.) between it and the land.

**Macosh Rocks—Light buoy.**—Barley Point is fringed by Barley Ridges, which are rocky reefs; Macosh Rocks, the western part of these ridges, dry 2 feet (0.6 m.) and a black can light buoy, exhibiting a flashing white light is moored in 7 fathoms (12.8 m.) on their southern side.

The coast from Barley Point trends northeastward about 5 miles to Ru Staffnage, and thence northward about  $3\frac{1}{2}$  miles to Davarr Island and the head of Kildalloig Bay.

**Arranman Barrels—Light buoy.**—Dunnighn Point, about 1.3 miles from Barley Point, is a small isolated mound, and there is a granite cross on the point about 600 yards westward of it. Arranman Barrels, a rocky ledge, extends  $\frac{1}{4}$  mile from Dunnighn Point, and is marked on its outside edge in 8 fathoms (14.6 m.) by a black can light buoy exhibiting a flashing white light. The name is de-

rived from several large stones which dry several feet before the body of the ledge shows, and bear some resemblance to barrels.

**Sanda Island**, over 1 mile long east and west and  $\frac{1}{2}$  mile wide, is the largest of a group of islets and rocks off that part of Cantyre locally known as the Southend Coast, Sanda Sound, the channel between, being 1.3 miles across, with depths of from 5 to 32 fathoms, (9.1 to 58.5 m.) but its navigable width is reduced to less than 1 mile by Sheep Island, which projects about 1,200 yards into the channel from the northeastern end of Sanda. Near the middle of the southern side of Sanda Island is Ship Rock, which from seaward appears to be isolated.

For the positions of the islets and rocks around Sanda Island, see the chart.

**Light**.—A flashing white light with red sector, 165 feet (50.3 m.) above water, visible 18 miles, is shown from a white tower, 48 feet (14.6 m.) above water, on Ship Rock.

**Fog signal**.—A fog signal is sounded at the lighthouse. It is about 150 feet above the sea, and may be best heard when bearing east and west, through north.

**Lifeboat signals** are shown from this lighthouse.

**Anchorage—Beacon**.—A rocky spur extends 150 yards off the northern side of Sanda Island, and is marked on its outer end by a red pillar beacon surmounted by a ball. Good shelter may be obtained from southwesterly gales in 4 to 5 fathoms (7.3 to 9.1 m.) at the anchorage eastward of it, with local knowledge, but as the space is limited and the tidal currents are rapid through Sanda Sound, no stranger should attempt to enter it. In South Bay, a small bight on the southern side of the island between Ship Rock and Elbow Point, good temporary anchorage may be obtained in from 6 to 8 fathoms (11.0 to 14.6 m.).

**Paterson Rock**,  $\frac{1}{2}$  mile southeastward from Glunimore Islet, the easternmost of the Sanda Group, is 400 yards in extent, east and west, dries at low water and is generally marked by breakers.

**Buoy**.—A black bell buoy, with an iron spar cage surmounted by a staff and ball, is moored in 17 fathoms (31 m.) on its southern side, but from its exposed position it is not to be relied on.

**Clearing marks**.—Ram Point, the northern extremity of Sheep Island, in range with the western end of Glunimore,  $308^\circ$ , leads southwestward of Paterson Rock; and Lamb Point and West Scart Rock open northward of Glunimore,  $281^\circ$ , leads northeastward of it. Davarr Island opening eastward of Ru Staffnage,  $348^\circ$ , leads 2 miles eastward of the rock.

The rock is covered by the red sector of Sanda Light.

**Tides and tidal currents—Round the Mull of Cantyre**.—The current in the fairway of the North Channel runs in from 5 hours

before until high water, and out from 1 hour after until 6 hours after high water. About  $3\frac{1}{2}$  miles westward from the Mull of Cantyre the direction of the in-going current is  $138^\circ$ , and its greatest rate 4 knots at springs, while the direction of the out-going current is  $316^\circ$ , and its greatest rate  $3\frac{1}{4}$  knots at springs. The current runs south-westward close along the shore between Skerrinagal, on the western coast of the Peninsula of Cantyre, 5 miles northeastward of the Mull, and the Mull from  $4\frac{1}{2}$  hours after high water until  $1\frac{1}{2}$  hours before the next high water, at a greatest rate of 5 knots at springs, and northeastward from  $1\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water at the same rate, blending off the Mull with the main currents in the North Channel, and setting from the Mull southeastward toward Deas Point. Eastward of Deas Point and toward Sanda Island and Sound the current sets eastward from 6 hours before until high water and westward from high water until 6 hours after.

**Race.**—While the last of the west-going current from Sanda Island to Deas Point is running it meets the first of the southeast-going current off Deas Point, causing overfalls and especially a race when the wind opposes the sea in southerly gales. The race extends about  $1\frac{1}{2}$  miles off Deas Point and should be avoided. It is high water at the Mull of Cantyre at 10h. 35m.; but the rise of the tide, which does not exceed 4 feet (1.2 m.) at springs, is somewhat irregular and is sometimes entirely masked by the effect of the wind. This does not affect the currents, which do not depend on the local rise and fall so much as upon the times of high water between the Solway Firth and the Mersey River, where the rise and fall is from 25 to 28 feet (7.6 to 8.5 m.). As long as the race off Deas Point prevails the water eastward of it is tolerably smooth, but when from the slackening of the west-going current the ingoing current setting southeastward around the Mull of Cantyre prevails—that is, at about low water—the change of current is accompanied by a roller breaking on the beach, even in calm weather, which creates a surf, lasting from 5 to 10 minutes, sufficient to swamp a boat.

**Round Sanda Island and in Sanda Sound.**—It is high water, full and change, at Sanda Island at 11h. 40m.; springs rise 8 feet, neaps  $6\frac{1}{2}$  feet. In mid-channel in Sanda Sound the east-going current runs from 6 hours before high water until high water, at a rate of 5 knots at springs; and the west-going current runs from high water until 6 hours after high water, at a similar rate. On the northern shore of Sanda Sound the current sets eastward from 5 hours after high water until 1 hour before the next high water, and westward from 1 hour before until 5 hours after. The rate of these inshore currents is great off the salient points but moderate or little felt in Carskey Bay. During the west-going current there is a con-

siderable eddy to the westward of Sanda, so that a vessel drifting westward with the main current, after passing Ship Rock, may be caught in the eddy and drifted to the anchorage northward of Sanda Island. On the eastern side of Sanda there appears to be no eddy, as the east-going current passes between Sanda Island and Sheep Island and joins the current running to the eastward southeastward of Sanda.

There are overfalls and races northward of the Sanda Islands when the weather is at all stormy, especially a race named Tum-banach, halfway between Sheep Island and the mainland to the northward.

**The coast.**—At 1.4 miles northward of Ru Staffnage, Blindman Rock extends about 200 yards offshore. Achinhoan Head, near which are some remarkable caves, is about 800 yards farther northward.

**Kildalloig Bay**, between the mainland of the Peninsula and Davarr Island, is formed by The Dorling, a sand flat, bordered on its northern and western sides by a gravelly ridge, impassable for boats even at high water, but affording protection to the bay during northwesterly gales.

A good anchorage berth is in about  $5\frac{1}{2}$  fathoms (10.1 m.), with the eastern point of Davarr Island bearing  $14^\circ$ , and Millmore Beacon just open northward of Otterbach Point; this position is out of the current and about 600 yards offshore abreast of Kiidalloig House, which is surrounded with wood.

**Davarr Island** ( $55^\circ 26' N.$ ,  $5^\circ 32' W.$ ), which is surmounted by a beacon, rises to a height of 374 feet (114 m.) near its southern end; it is very conspicuous from seaward. The eastern and northern coasts of the island are rocky but steep-to, there being a depth of 5 fathoms (9.1 m.) at the distance of less than 200 yards. From the western end of the island, the inner edge of The Dorling extends westward 800 yards and then turns suddenly southward to a low point of the mainland a quarter of a mile distant. Off the southeastern point of the island there are heavy overfalls during strong southerly winds and the south-going current.

**Light.**—A flashing white light, 120 feet (36.6 m.) above water, visible 17 miles, is shown from a white tower, 65 feet (19.8 m.) high, on the northeast point of Davarr Island. The lighthouse is connected by telephone with Campbelton post office.

**Lifeboat signals** are shown from this lighthouse.

**Fog signal.**—Near the lighthouse a fog signal is established. See Light List.

**Campbelton Loch**, nearly  $\frac{1}{2}$  mile broad at its entrance between Davarr Island and Macrignan Point, runs in westward about 1,600



yards, the navigable width decreasing to about 250 yards between The Dorling and the flats on the opposite shore, and then opens out into an extensive basin upward of 1 mile long and  $\frac{1}{2}$  mile wide, affording a completely sheltered anchorage for vessels of any size, and a convenient port of refuge for vessels bound through the North Channel.

**Depths.**—There are depths of from 24 to 17 fathoms (43.9 to 31 m.) in the entrance, which decrease to from 6 to 9 fathoms (11 to 16.5 m.) in the narrows. Within the loch the depths are generally from 7 to 9 fathoms (12.8 to 16.5 m.) with a level bottom of mud, and sand and shells in places.

**The Dorling**, extending from the western end of Davarr Island, trends westward about 800 yards to Millmore Beacon, where it suddenly turns southward to a low point on the mainland  $\frac{1}{4}$  mile distant, is fairly steep-to on its northern side and is marked at its north-western angle by Millmore Beacon, to the southward of which is a narrow ridge that never covers.

**Light beacon.**—Millmore Beacon is built of gray concrete and is surmounted by a black cylindrical gas tank and lantern. A flashing white light, 23 feet (7 m.) above water, visible 9 miles, is shown from the beacon.

**Buoy.**—A black can buoy, marked "Campbelton Outer," is moored in 9 fathoms (16.5 m.) 900 yards eastward of Millmore Beacon, and marks the southern side of the channel.

**Macringan Point** ( $55^{\circ} 26' N.$ ,  $5^{\circ} 33' W.$ ), on the northern side of the entrance, is steep-to at the distance of 200 yards on its southern side, but shoal water, with patches of from  $1\frac{3}{4}$  to 3 fathoms (5.5 m.), extends 400 yards eastward and 600 yards northeastward from it. Between it and Trench Point, 1.2 miles within the loch, shoal water extends 400 yards offshore.

**Buoy.**—A red conical buoy, called the Millbeg Bank Buoy, is moored in 2 fathoms (3.7 m.) northeastward nearly 500 yards from Millmore Beacon, and marks the northern side of the channel.

**Trench Flat—Beacon.**—A sandy flat runs out eastward of Trench Point, and is marked by a red beacon 25 feet (7.6 m.) high, 300 yards  $82^{\circ}$  from that point.

**Beacon.**—A wooden perch, surmounted by a spherical cage, 16 feet (4.9 m.) above high water, marks a spit that dries, situated 300 yards northwestward of Trench Point. Shoal water extends 200 yards southward of this beacon.

**Banks.**—Methe Bank, a patch nearly 100 yards in extent, with a least depth of  $5\frac{1}{2}$  fathoms (10.1 m.), lies 600 yards westward of Millmore Beacon. A patch, with a least depth of  $5\frac{3}{4}$  fathoms (10.4 m.), lies in the southern part of the loch.

**Buoys.**—Two small red mooring buoys are placed about 300 yards off the southern shore of the loch to the northward of Heather House.

**Lights.**—A small fixed lantern light, showing red to the eastward over the anchorage ground in the loch and white toward the harbor, is exhibited from the end of the Old Pier.

A small fixed lantern light, showing green to the eastward and white toward the harbor, is exhibited from the New Pierhead.

A small fixed white lantern light is exhibited at Dalintober Pier.

**Harbor.**—An artificial harbor about 200 yards in extent, is formed between the New and Old Piers in front of the town at the head of the loch. The inner part of the harbor dries at low water, but in the outer part there are depths of from 6 to 7 feet (1.8 to 2.1 m.). The opening into the harbor is on its northeastern side.

**Buoys.**—A black can buoy marks the edge of the bank about 100 yards southeastward of New Pier Lighthouse.

Two red can buoys mark a drainpipe about 200 yards northward of Old Pier Lighthouse.

**Anchorage.**—The holding ground at the head of the loch is bad and unsafe for small craft, but it is good eastward of a line joining Eagle Lodge and the old burial ground.

The coast trends northeastward from Macringan Point, and at the distance of nearly 1 mile Smerby Rocks, and Long Rock, which dries 5 feet (1.5 m.), with the shoals off them, extend outward 750 yards.

**Smerby Rocks—Bell buoy.**—A black bell buoy is moored in a depth of 5 fathoms (9.1 m.), about 400 yards 136° from the center of Long Rock.

**Otterard Rock** lies 1.4 miles 45° from Macringan Point and about 1,600 yards from the nearest shore; it has a depth of 13¼ fathoms (3.1 m.) and deep water around. There is a channel about 750 yards wide between the 5-fathom (9.1 m.) curves off Long Rock and Otterard Rock. Pluck Point seen through the passage between Ross Island and Kildonan Point, 14°, leads through this channel, but it should never be attempted by a stranger.

Trench Beacon, in range with Macringan Point, 235°, leads southward of Otterard Rock, and Saddell House, a white building, in range with Ross Island, leads eastward of it.

Otterard Rock is the best fishing ground in the locality.

**Light and whistle buoy.**—In a depth of 5 fathoms (9.1 m.), about 300 yards southeastward of Otterard Rock, a light and whistle buoy is placed. It exhibits a flashing white light.

**Tides.**—It is high water, full and change, at Campbelton at 11h. 45m.; springs rise 8¾ feet, neaps 6 feet; neaps range 4 feet. The tidal currents within the loch are weak.

**Directions.**—Campbelton Loch is easily recognized by Davarr Island. From the southward, round the northeastern point of Davarr Island, on which is the lighthouse, at the distance of about 400 yards, and then steer about  $243^{\circ}$ , leaving Campbelton Outer Black Buoy on the port hand, Millbeg Bank Red Buoy on the starboard hand, and Millmore Beacon about 200 yards on the port hand.

From 200 yards northward of Millmore Beacon steer westward and anchor as convenient, using the chart as a guide. The land on the southwestern side of the loch rises to Ben Ghuilean, 1,160 feet (353.6 m.) high, and sailing vessels must be prepared for the very heavy gusts which occasionally come through the glens.

From the northeastward approach with Saddell House open eastward of Ross Island until Trench Beacon is open southward of Macringan Point to clear Otterard Rock. Pass about a quarter of a mile southward of Macringan Point and then steer to pass 200 yards northward of Millmore Beacon and as above directed.

When working into the loch inside Trench Point, a good turning mark when standing to the southward is the old and new pierheads closing  $314^{\circ}$ .

**At night**, from a position about 400 yards northward of Davarr Light, steer to pass 200 yards northward of Millmore Beacon Light, and thence westward to the anchorage.

Caution is necessary in the narrows.

**The town** of Campbelton ( $55^{\circ} 26' N.$ ,  $5^{\circ} 36' W.$ ), situated at the head of the loch, has rather an imposing appearance with its several churches and town hall, and numerous scattered villas fringe the shores of the bay.

Wooden and iron vessels of considerable size are built at the slips of the shipbuilding yard on the inner side of Trench Point. The place is an important fishing center and is celebrated for the excellence of its whisky, which is manufactured on an extensive scale. The population was 8,663 in 1921.

**Communication.**—There is a daily steam service with Glasgow in winter and twice daily in summer; there is also telegraphic communication.

**Trade.**—The imports consist chiefly of coal and barley; the exports of coal, whisky, and fish.

**Coal and supplies.**—Coal can be supplied either alongside the front of the pier, where there is 12 feet (3.7 m.) water, or at the anchorage in lighters. There are usually about 280 tons in stock. Provisions can always be obtained. Good water is supplied by hose at the pier for a small payment.

**Lifeboat.**—Two lifeboats are stationed at Campbelton; the boat-house is situated at Craigbank on the southwestern side of the loch; there is also a rocket apparatus.

A conspicuous flagstaff stands at the inner end of the lifeboat slip.

**Storm signals** are shown from a staff on the pierhead.

**Arran Island**,  $17\frac{3}{4}$  miles long north and south and 9 miles wide, lies in the Firth of Clyde between the Peninsula of Cantyre and the coast of Ayrshire. The northern portion rises into mountains of a conical form, connected by sharp serrated ridges and intersected by deep gullies and ravines. Goat Fell, the highest peak, situated  $6\frac{1}{2}$  miles from the northern end and nearly 2 miles from the eastern coast of the island, attains a height of 2,863 feet (872.6 m.).

The southern portion of the island is undulating hilly ground sloping gently toward the sea and presents in its cultivated fields and bright patches of verdure a contrast to the rugged and sterile character of the northern part. The coasts are generally low and indented with several bays, one of which, Lamlash Harbor, affords spacious and well-protected anchorage.

**The south coast** of the island trends eastward for  $2\frac{1}{2}$  miles from Clachog Point, its southwestern extremity to Bennan Head, and thence, forming a bay, 2 miles to Kildonan Point; rocky low-water spurs extend about a quarter of a mile off it.

**Lloyd's signal station.**—On Kildonan Point, the southern extremity of Arran Island, stands the square keep of an ancient castle; westward of these ruins is a coast-guard station and Lloyd's Signal Station, with which vessels may communicate by International Code. A rocket apparatus is stationed at Kildonan.

**Pladda Island** ( $55^{\circ} 26' N.$ ,  $5^{\circ} 07' W.$ ), about 600 yards long, north and south, narrow, and 35 feet (10.7 m.) high, lies 1,400 yards southwestward from Kildonan Point; there is no navigable passage between, as spurs extend from Kildonan Point and a rocky ledge from Pladda.

**Light.**—A group flashing white light, 130 feet (39.6 m.) above water, visible 17 miles, is shown from a white tower, 95 feet (29 m.) high, near the southern end of Pladda Island.

**Fog signal.**—A fog signal is sounded. See Light List.

**Tidal currents.**—The tidal currents are strong off Pladda, and there is a race southward of the island during the west-going current. Between Pladda and Kildonan Point the east-going current runs at a rate of  $3\frac{1}{2}$  knots at springs from 4 hours after high water until 2 hours before the next high water, and the west-going current from 2 hours before to 4 hours after high water, but southward of Pladda the east-going current does not begin until low water. The west-going current southward of Pladda runs from high water until  $5\frac{1}{2}$  hours after high water, but the rates southward and southeastward of Pladda are not so great as between the island and Kildonan Point.

The east coast of Arran trends northeastward from Kildonan Point, with an irregular outline, to Lergybeg Point, a distance of  $1\frac{3}{4}$  miles.

**Whiting Bay** is a slight indentation between Lergybeg Point and Kingscross Point,  $2\frac{3}{4}$  miles northward. It affords good anchorage in from 5 to 10 fathoms (9.1 to 18.3 m.), sand, about 600 to 800 yards offshore, sheltered from westerly winds. Its shores are lined with white cottages and trees, the large village of Rosebank extending over a mile along the shore. The boat harbor at Rosebank, marked on the chart, is a small break in the low-water rocks, the channel into it being marked by small perches.

**Light.**—A small fixed white light is shown from a post on the pierhead at Rosebank.

**Lamlash Harbor**, on the eastern side of Arran, is a large and good anchorage for vessels of any size. From Kingscross Point, its southern extremity, to Clauchlands Point, its northern extremity, the distance is 2.4 miles in a northerly direction, but the harbor is to a great extent fronted by Holy Island.

Lamlash Harbor from its position possesses great advantages as a harbor of refuge, and fleets of 60 or 70 sail have been sometimes within it for weeks at a time.

**Depths.**—There is a least depth of 15 fathoms (27.4 m.) in the fairway of the southern entrance, and of 6 fathoms (11 m.) in the fairway of the northern entrance. The general depths in the harbor are from 13 to 22 fathoms (23.8 to 40.2 m.).

**Holy Island** is 1.6 miles long north and south, 1,200 yards wide, and 1,025 feet (312.4 m.) high, with columnar cliffs on its eastern side. The 10-fathom (18.3 m.) curve passes about 350 yards off its east coast in places. Vessels passing Holy Island in westerly gales should do so under reduced canvas, or keep a good offing, as the squalls are very violent.

**Light.**—An alternating flashing white and red light, 124 feet (37.8 m.) above water, visible 17 miles, is shown from a white square tower, 77 feet (23.5 m.) high, at Pillar Rock Point, on the southeast coast of Holy Island.

A fog signal is sounded at the lighthouse. See Light List.

**South Channel.**—The southern entrance to Lamlash Harbor, nearly 700 yards wide, between Kingscross Point and Holy Island, has its navigable channel narrowed to about 400 yards by Fullarton Rock.

**Light.**—A fixed red light, 46 feet (14 m.) above water, visible 12 miles, is shown from a white tower, 56 feet (17 m.) high, on the southwestern extremity of Holy Island.

**Fullarton Rock—Light buoy.**—Fullarton Rock ( $55^{\circ} 31' N.$ ,  $5^{\circ} 05' W.$ ), with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, lies 150 yards eastward of Kingscross Point and is marked on its eastern side by a black can buoy in 13 fathoms (23.8 m.), exhibiting a flashing white light.

**South Bank.**—There are depths of less than 5 fathoms (9.1 m.) for 250 yards southward of Holy Island, but South Bank, with depths of from  $5\frac{1}{4}$  to 6 fathoms (9.4 to 11 m.), and on which is South Rock, with  $4\frac{1}{2}$  fathoms (8.2 m.) water, extends 500 yards farther southward, with a width of 400 yards.

**North Channel.**—The northern entrance to Lamlash Harbor, between the northern end of Holy Island and Clauchlands Point and the land westward of it, is about 1,300 yards wide, but the navigable channel, with a depth of 6 fathoms (11 m.), is 300 yards wide.

About 200 yards off Clauchlands Point lies Hamilton Rock, which never covers, and there is deep water 150 yards eastward of it. A narrow gravelly ledge or bar, with depths of from  $1\frac{1}{2}$  to 7 fathoms (2.7 to 12.8 m.), connects Holy Island with Clauchlands Point, depths of 5 fathoms (9.1 m.) and less extending northward nearly  $\frac{1}{4}$  mile from the island and southward 750 yards from the point. Inside the bar the channel widens, and the depth increases to 10 and 15 fathoms (18.3 to 27.4 m.). A shoal bank extends from the northern side of North Channel within the entrance, its 3-fathom (5.5 m.) edge being 500 yards from the shore and very steep-to.

**Light buoy.**—A black can light buoy, showing a flashing white light, is moored in 5 fathoms (9.1 m.) at the southern end of the shoal water extending from Clauchlands Point. Vessels navigating North Channel must pass southward of the buoy.

**Deacon Rock**, a patch of  $5\frac{3}{4}$  fathoms (10.5 m.), lies 800 yards  $243^{\circ}$  from the northern point of Holy Island.

**Piers.**—An old quay extends a few yards from the northwestern shore of the bay at Lamlash Village, and nearly 200 yards north-eastward of it is the new pier, which extends 180 yards from the shore, and has a depth of 7 feet (2.1 m.) at its head at low-water springs. A corrugated iron shed, with a flagstaff attached, stands on the head of the new pier.

**Light.**—A fixed red light, 33 feet (10 m.) above water, is shown from a pillar at the end of Lamlash New Pier.

**Buoy.**—A red mooring buoy is situated 400 yards southeastward from the red light on the New Pier.

**Anchorage.**—The best anchorage ( $55^{\circ} 32' N.$ ,  $5^{\circ} 07' W.$ ) in Lamlash Harbor in ordinary weather is about 700 yards eastward from the New Pier head, in from 10 to 15 fathoms (18.3 to 27.4 m.) sand and mud; but there is better shelter during easterly or southeasterly gales under Holy Island, avoiding Beacon Rock. It is advisable

not to anchor in less than 10 fathoms (18.3 m.) as the water shoals suddenly from 10 to 7 and 2 fathoms (18.3 to 12.8 and 3.7 m.).

**Tides.**—It is high water, full and change, in Lamlash Harbor at 11 h. 49 m.; springs rise 10 feet, neaps 7 feet; neaps range 4 feet.

**Tidal currents.**—The current runs northward along the east coast of Arran during the rising tide, and to the southward during the falling tide. To the northward of Holy Island the north-going current is diverted somewhat to the eastward, so that it takes a direction toward the west coast of Bute Island, leaving an area in Bute Sound and Inchmarnoch Water where the tidal currents are weak. The greatest rate of the currents off the salient points on the east coast of Arran is 3 knots.

A part of the north-going current passing outside Holy Island enters the South Channel into Lamlash Harbor and leaves the harbor by the North Channel, while a part of the outside south-going current enters the North Channel and passes out by the South Channel. The rate of these currents does not exceed  $1\frac{1}{2}$  knots in the entrance channels, and is scarcely felt at the anchorage in the harbor.

**Lamlash Village** is on the northwestern shore of the harbor; near its northeastern end and close to the shore is a conspicuous red church with a spire; the coast guard station is a little southwestward of it. Steam vessels run daily to and from Ardrossan; there is also telegraphic communication.

**Landing.**—With the exception of the new pier, also near Cordon, and in smooth water only a small stone pier extending to the end of the off-lying rocks from near a small yellow shed below Gortonallister, there is no good landing place on the Arran side of the harbor at low water.

**Conspicuous marks.**—The following objects are conspicuous:

Strabane House, which is a dark-red building with a gabled roof, standing among trees.

A small white hut near the foreshore, 300 yards southwestward of Brodick Castle.

Other conspicuous huts are shown on the chart.

The Public Hall, in the southwestern corner of the bay, is a gray building, and can be recognized as being larger than the surrounding houses.

Brodick Free Church Spire just shows over the trees, but is not so conspicuous.

The tower of Brodick Castle is large and conspicuous, and is situated on the southwestern corner of the castle.

The old quay is a well-built camber, and has a flagstaff on the east side. There is a slip-way for boats.

**Target moorings.**—These have been laid to the eastward of the river entrance, and a buoy marks the position.

**Brodict Bay** ( $55^{\circ} 35' N.$ ,  $5^{\circ} 08' W.$ ), an indentation about  $1\frac{1}{4}$  miles deep, lying from 2 to  $3\frac{1}{2}$  miles northward of Clauchlands point and about the middle of the eastern side of Arran, affords good anchorage in from about 11 to 17 fathoms (20.1 to 31.1 m.) in westerly winds.

Numerous mountain streams, the principal being that issuing from Glen Rossie, flow into the bay, and the beach has the appearance of sand, but is pulverized granite, the débris of the hills. On the northern side of the bay, Brodict Castle, surrounded by wood, occupies a high and picturesque position. The bay is much frequented as a summer resort during summer. The tidal currents in the bay are weak.

**The coast** of Arran from Merkland Point, the northern extremity of Brodict Bay, trends northward for 5 miles to Rugshraith Point, and thence northwestward for 4 miles to The Cook of Arran, a large block of red sandstone near the northern extremity of the island; with the exception of Sannox Rock, it is bold throughout.

The coast from Rugshraith Point to The Cock of Arran is the southwestern shore of Bute Sound.

**Sannox Rock**, with 8 feet (2.4 m.) water, lies  $3\frac{1}{2}$  miles northward of Merkland Point and  $\frac{1}{4}$  mile offshore. Birch Point, open of Corrie Point  $172^{\circ}$ , leads eastward of it. The rock lies off a small sandy bay occasionally used as a place of shipment, the principal produce being from some seams of barytes in the neighboring glen, or paint manufactured therefrom.

**Bute Island** is  $13\frac{1}{2}$  miles long south and north, and has an average breadth of  $3\frac{1}{2}$  miles; its northern part is separated from the mainland of Argyllshire by the narrow channel named the Kyles of Bute. It is indented by several bays, forming natural harbors, the most important being Rothesay Bay on the eastern coast, at the head of which is the town of Rothesay.

The island attains in Windy Hill, in the northeastern part of the island, the height of 906 feet (276.1 m.).

The eastern coast of the southern half of Bute Island forms, with the opposite coast of Renfrewshire, the narrow portion of the Firth of Clyde, the entrance to which is between Garroch Head on the island side and Farland Head on the mainland side, the distance across being  $4\frac{1}{2}$  miles, but this space is divided into two channels by Great and Little Cumbræ Islands. From the narrows, the Firth runs northeastward for about 16 miles, and then turns suddenly eastward for a distance of 4 miles to abreast of Greenock.

**Garroch Head** ( $55^{\circ} 43' N.$ ,  $5^{\circ} 02' W.$ ) is the southern extremity of Bute Island, and the entrance to Bute Sound is on its western



side and that to the narrows of the Firth of Clyde on its eastern side; it is steep-too, but there is a tidal race during the south-going currents immediately off the point which should be avoided; it is caused by the meeting of the currents. The coast from Garroch Head trends eastward 1 mile to Runnan Eun Point.

**Tides.**—It is high water, full and change, at Garroch Head at 11 h. 49 m.; springs rise 10 feet.

**Light.**—A flashing white light, 28 feet (8.5 m.) above water visible 10 miles, is shown from a white iron tower, 25 feet (7.6 m.) high, on the extremity of Runnan Eun Point.

**The entrance to the Firth of Clyde, between Runnan Eun Point and Little Cumbrae Island,** is  $1\frac{1}{4}$  miles wide, and this is the narrowest part of the Firth, but it is the channel generally used by vessels bound to or from Greenock and Glasgow; the other channels are that eastward of Little Cumbrae, and that through the Kyles of Bute, which is narrow and intricate, and used only by passenger steamers and small craft.

**Kilcattan Bay,**  $1\frac{1}{2}$  miles northward of Runnan Eun Point, is about 1 mile wide, and is much frequented by vessels sheltering from westerly and southwesterly winds. The head and northern part of the bay are shoal for about 600 yards offshore. There is a small village with a jetty on the southwestern shore, and there are a few scattered cottages elsewhere, but no supplies can be obtained.

**The coast from Kerrytonlia Point,** the northern entrance point of Kilcattan Bay, trends northward 5 miles to Bogany Point, the southern entrance point of Rothesay Sound.

**Buoy.**—A black can buoy, No. 37, is moored 1,400 yards northward of Kerrytonlia Point, and marks the edge of the shoal water southward of Bruchag Head.

**Ascog Patches.**—About 1 mile southward of Bogany Point and 1,200 yards eastward from the small islet of Ascog, which is 4 feet (1.2 m.) high and close to the shore, are two rocky patches, 300 yards apart north and south; there is a depth of  $4\frac{1}{4}$  fathoms (7.7 m.) on the southern patch and of 5 fathoms (9.1 m.) on the northern patch. Both patches are on a bank of less than 10 fathoms (18.5 m.), and the bottom is uneven between them and Bogany Point.

**Clearing marks.**—The fall of Runnan Eun Point, just open of the fall of Bruchag Head,  $185^\circ$ , leads 400 yards eastward, and the northern end of the trees on Ardbeg Point in range with Bogany Point,  $304^\circ$ , leads 500 yards northeastward of the patches.

**Bogany Point—Buoy.**—A rocky shelf and shoal water of less than 3 fathoms (5.5 m.) extend for a distance of 250 yards around Bogany Point. A black can buoy, No. 36, is moored near the outer edge of the shoal water, about 100 yards eastward of the point.

**Rothesay Bay.**—Ardberg Point ( $55^{\circ} 51' N.$ ,  $5^{\circ} 04' W.$ ) is situated about  $1\frac{1}{2}$  miles northwestward of Bogany Point, and Rothesay Bay, lying between, is about 1 mile deep. It is much frequented by vessels wind-bound.

**Depths.**—There are depths of from 20 to 5 fathoms (36.6 to 9.1 m.) in the bay to the distance of about 250 yards from the shore. A rocky ledge extends off for 350 yards around Ardbeg Point, and this point should be given a berth of a quarter of a mile.

**Craigmore Pier** extends northward 180 yards from the shore 350 yards northwestward of Bogany Point, and there is a depth of 14 feet (4.3 m.) alongside its outer end.

**Lights.**—Two fixed lights placed vertically, the upper red and the lower white, are exhibited from a pillar at the end of Craigmore Pier, and 17 and 22 feet (5.2 and 6.7 m.) above the pier.

**Mooring buoys.**—There are five mooring buoys moored in Rothesay Bay.

**Anchorage.**—There is anchorage in any part of the bay, avoiding the buoys, but a bank, with depths of from 8 to 10 fathoms (14.6 to 18.3 m.), which extends northward from near the swimming bath on the southern side of the bay, has stony and foul bottom. The holding ground elsewhere in the bay is good, that on the western side being the best.

A choppy sea sets in with northeasterly winds.

Anchorage is prohibited westward of the fairway buoys, between them and the 5-fathom (9.1 m.) curve.

If anchoring off Ardbeg Point, keep clear of the telegraph cables crossing Rothesay Sound.

**Pier.**—A pier, built of wood and stone, extends about east and west for 270 yards at the head of the bay. There are depths of from 12 to 30 feet (3.7 to 9.1 m.) alongside its northern front and of 12 to 14 feet (3.7 to 4.3 m.) inside the western arm. Within the eastern arm there are two basins, partly dry at low water, used by small vessels of not over  $8\frac{1}{2}$  feet draft. The entrance to the outer basin is 116 feet wide, and that to the inner basin 21 feet wide. At times there is a dangerous surge caused by passenger steam vessels.

**Lights.**—A fixed red light is exhibited, 23 feet (7 m.) above water, from the eastern end of Rothesay Pier, and a fixed green light, 23 feet (7 m.) above water, from the western end of Rothesay Pier.

A fixed red electric light is exhibited, 25 feet (7.6 m.) above water, from a lamp-post on Albert Pier, the eastern side of the entrance to the outer basin.

A fog bell, at the western end of Rothesay Pier, is sounded when steamers are expected.

**Tides.**—It is high water, full and change, in Rothesay Bay, at 11h. 57m.; springs rise  $10\frac{1}{2}$  feet, neaps about 9 feet; neaps range about 7 feet.

Heavy southwesterly gales, lasting two or three days, if they occur at springs, may raise the water 5 feet, and a continuance of easterly winds may lower it from 1 foot to  $1\frac{1}{2}$  feet. Generally, the water is raised with westerly and lowered with easterly winds.

**Tidal currents.**—The tidal currents in Rothesay Sound, between Rothesay and the main, are weak and inappreciable, except over the flats along the shore or close round the points.

**The town** of Rothesay ( $55^{\circ} 50' N.$   $5^{\circ} 03' W.$ ), the capital of Butheshire, and a favorite summer resort is situated at the head of Rothesay Bay, but the suburbs extend along the whole of its shores. The ruins of Rothesay Castle are in the middle of the town.

The population of Rothesay was 15,218 in 1921.

**Supplies.**—Water may be obtained at Rothesay in the basin inside the eastern arm of the pier, and ordinary supplies are obtainable, but there are no facilities for coaling a steamer.

**Hospital.**—There is good hospital accommodations, the Robertson-Stewart Hospital admitting infectious diseases.

**Communication.**—The trade of the port is carried on partly by small coasters but mainly by steamers plying on the Firth of Clyde. In summer there are from 80 to 100 arrivals and departures daily. Steamers run regularly to Greenock and Glasgow and to all ports in the Firth. Railroad communication is maintained by steamers to the Caledonian railroad piers at Wemyss Bay and Gourrock, to the Glasgow and South Western Pier at Greenock, and to the North British Railway Pier at Craigendoran. There is telegraphic communication.

**Toward Point**, the northern entrance point to Rothesay Sound, bears  $56^{\circ}$  distant nearly 2 miles from Bogany Point; it is low and rocky.

**Light.**—A flashing white light, 70 feet (21.3 m.) above water, visible 14 miles, is shown from a white tower, 63 feet (19.2 m.) high, on Toward Point.

**A fog signal** is sounded from a tower 40 yards southeastward of the lighthouse. See Light List.

**Pier.**—A pier, about 100 yards in length, extends in an easterly direction from the shore about 150 yards northward of Toward Point. A light is shown from the pierhead.

**Buoy and perch.**—The shoal water southwestward of Toward Point is marked by a perch at the low-water line, and by a black can buoy, No. 34, moored in about 4 fathoms (7.3 m.) water, and nearly 800 yards from the lighthouse.

**Toward Bank** ( $55^{\circ} 51' N.$ ,  $5^{\circ} 00' W.$ ), about half way between Bogany and Toward Points, is a detached shoal, lying in the fair-way of vessels running through Rothesay Sound.

The bank is 400 yards in extent, with depths of less than 5 fathoms (9.1 m.), the least water,  $2\frac{1}{2}$  fathoms (4.6 m.) being situated nearly 1 mile  $234^{\circ}$  from Toward Point Lighthouse. There is a channel, 400 yards wide with 6 fathoms (11.0 m.) water, between the bank and the shoal water and patches of from  $1\frac{3}{4}$  to 3 fathoms (3.1 to 5.5 m.) extending half a mile off the northeastern shore, but it should not be taken without local knowledge.

**Light buoy.**—A light buoy, No. 35, painted red, exhibiting an occulting white light, is moored in 3 fathoms (5.5 m.) on the north-western edge of Toward Bank. Vessels should pass 400 yards southward of the buoy.

**Clearing marks.**—Cloch Lighthouse and Toward Point fog signal tower in range, bearing  $35^{\circ}$ , lead southeastward of Toward Bank, but this mark must not be followed within 1,400 yards from Toward Point Lighthouse, except in vessels of light draft.

A conspicuous white cottage near South Hall in range with the Telegraph Cable House on Ardyne Point, bearing  $317^{\circ}$ , leads south-westward of Toward Bank.

**Little Cumbrae Island**,  $1\frac{1}{2}$  miles long, northeast and southwest, and  $\frac{3}{4}$  mile broad, attains about 600 yards within its western extremity a height of 404 feet (123.1 m.), and on this summit is the ruin of an old tower.

The middle of the eastern side of the island is foul to a distance of about 400 yards, and Twelve-foot Spit, a patch with 2 fathoms (3.7 m.) water, lies about 300 yards eastward of its northeastern end.

The distance between the island and the land eastward of it is 1.3 miles, but the channel is considerably narrowed by shoals off its eastern shore.

Cumbrae Pass, between Little and Great Cumbrae Island, is a good navigable channel 800 yards wide with from 7 to 17 fathoms (12.8 to 31.1 m.) water.

**Light.**—A group flashing white light, 115 feet (35.1 m.) above water, visible 16 miles, is shown from a white tower, 36 feet (11.0 m.) high, on Cumbrae Elbow, the western point of Little Cumbrae Island.

**A fog signal** is sounded from the lighthouse. See Light List.

**Great Cumbrae Island**, nearly  $3\frac{1}{2}$  miles long, northeast and southwest, and  $1\frac{1}{2}$  miles wide, attains a height of 412 feet (125.6 m.) near its middle. Its coasts are bold, except in Millport Bay, on its southern side, and at Portachur Point, its southwestern end.

The island produces grain and green crops of all kinds, besides having a considerable area of pasturage, and its coasts abound with

fish. The population was 5,952 in 1921, but numerous visitors reside at Millport during summer.

Great Cumbrae is in telegraphic communication with the mainland by a cable crossing Largs Channel; and by steamer with Glasgow and other ports on the Firth of Clyde.

**Portachur Spit—Buoy.**—Portachur Spit runs off nearly a quarter of a mile from Portachur Point, and is marked near its outer extremity by a red conical buoy, No. 38.

**Millport Bay** ( $55^{\circ} 45' N.$ ,  $4^{\circ} 56' W.$ ) is on the southern side of Great Cumbrae, and Millport Town, skirting its shores, is backed by rising ground partially covered with wood. The tall spires of the college and the square tower of the Established Church are noticeable. The bay is only frequented by small vessels; for the position of the anchorage, with two islets and several rocks, see the chart.

There is a pier in the western part of the bay with a depth of 7 feet (2.1 m.) alongside it at low water.

**Range lights.**—Front: A fixed red light is exhibited, at 24 feet (7.3 m.) above high water, from the pierhead.

Rear: A fixed red light is exhibited 29 feet (8.8 m.) above high water from a concrete block 20 feet (6.1 m.) above high water. The lights in range lead into the harbor.

**Tides and tidal currents.**—It is high water, full and change, at Millport at 11h. 50m.; springs rise 10 feet, neaps 6 feet. The tidal currents attain a rate of  $2\frac{1}{2}$  knots at springs through Cumbrae Pass.

**Mooring buoys.**—Two moorings are laid in Ballochmartin Bay, eastern side of Great Cumbrae Island.

**The eastern shore** of the Firth of Clyde trends northward about 2 miles from Farland Head; it then, after falling back to the eastward, again trends northward to Largs, which is opposite and distant 1 mile from the northeastern point of Great Cumbrae. Here there is the small Largs Bay, and from it the shore trends northward  $5\frac{1}{2}$  miles to Wemyss Point, just southward of which is Wemyss Bay, with a landing pier and railroad station.

**Hunterston, Southannan, and Fairlie Sands** extend across the hight commencing 2 miles northward of Farland Point, and dry in places as much as 1,600 yards offshore.

**Buoy.**—Brigurd Spit ( $55^{\circ} 44' N.$ ,  $4^{\circ} 54' W.$ ), the western extremity of Hunterston Sands is marked by a red conical light buoy, No. 39, showing a flashing white light, moored in 18 feet (5.5 m.) water.

A red conical buy is moored off the shoal water which extends northwestward from Brigurd Point, half a mile southward from No. 39 light buoy.

The 3-fathom (5.5 m.) curve off Southannan Sands, at a distance of 200 yards westward of Hunterston Perch, is marked by a red conical buoy.

**Beacon.**—The most projecting point of Southannan Sands is marked on its steep edge by Hunterston Perch, 25 feet (7.6 m.) high and painted red; this perch is situated midway between high-water mark on the mainland and Great Cumbræ, and 1 mile northeastward from Brigurd Spit Buoy; here the navigable channel is only 900 yards wide.

**Fairlie Patch** is 600 yards long north and south and 300 yards broad, with depths of less than 5 fathoms (9.1 m.), and a least depth of 1 foot (0.3 m.); it lies about 800 yards offshore 1,700 yards northeastward of Hunterston Perch, and affords protection to Fairlie Road, which is of limited extent, with a depth of 6 to 8 fathoms (11 to 14.6 m.) water.

**Buoy.**—A red conical buoy, No. 40, is moored westward of the northern end of the shoal part of Fairlie Patch.

**Kelburn Bank**, with  $3\frac{1}{2}$  fathoms (6.4 m.) least water, lies 1,400 yards northward from Fairlie Patch and 900 yards from the mainland, directly off Kelburn Glen.

**Clearing mark.**—Knock Hill, in range with Largs Pier  $2^\circ$ , leads westward of Fairlie Patch and Kelburn Bank.

**Fairlie Pier** ( $55^\circ 46' \text{ N.}$ ,  $4^\circ 52' \text{ W.}$ ).—The town of Fairlie extends upwards of half a mile along the shore, and near its northern end is the church, 400 yards northward of which a pier with a T head projects 250 yards from the shore into a depth of 12 feet (3.7 m.) at low water. The pier is just midway between Fairlie Patch and Kelburn Bank.

Special by-laws are in force with reference to vessels discharging carbide of calcium at this pier.

**Measured distance.**—A distance of 3,040 feet between the running mark beacons has been established northward of Fairlie. The course is  $357^\circ$  and  $177^\circ$  true.

**Largs.**—The town of Largs is a summer resort situated on a plain within Largs Bay, and backed by hills partially covered with plantations and broken by ravines. The population was 12,637 in 1921.

There is communication by the Glasgow and South Western Railway, and steamers run frequently between Largs and Glasgow and other ports on the Firth of Clyde.

**Pier.**—A pier, with an elbow, extending off the shore at the middle of the town, forms a small harbor frequented by herring boats and other small craft. There is a depth of 7 feet (2.1 m.) alongside the pier at low water.

**Lights.**—Two fixed lights are shown from the pierhead when steamers are expected: On the northern end red and white, red toward the north; on the southern end green and white, green toward the south.

**Fog signal.**—A bell on the southern end of the pier is sounded when steamers are expected.

**Tides.**—It is high water, full and change, at Largs at 11h. 50m.; springs rise 10 feet.

**Measured mile.**—About 3 and 4 miles northward of Largs Bay are two pairs of beacons indicating the length of a nautical mile, 6,080 feet, for testing the speed of steam vessels. Each beacon consists of a single pole 45 feet (13.7 m.) high with two arms 10 feet (3. m.) long forming a broad angle with the base, all painted white.

The southern pair of beacons stands of level ground near Skelmorlie Castle, the inner beacon bearing  $90^\circ$ , distant 100 yards from the outer one.

The outer of the northern pair of beacons is close to the shore, and from it the inner beacon (in a recess of the cliff) bears  $90^\circ$ , distant 83 yards.

The courses for running the measured mile, at right angles to the line of transit of the beacons, are  $0^\circ$  and  $180^\circ$ , the depths on the mile vary from 33 to 44 fathoms (60.4 to 80.5 m.), and the shore may be approached to the distance of 800 yards.

**Skelmorlie Bank** ( $55^\circ 52' N.$ ,  $4^\circ 55' W.$ ), 2,200 yards from the outer northern measured-mile beacon, has a least depth of 3 fathoms (5.5 m.), sand and shells, and is 700 yards in extent within the 5-fathom (9.1 m.) curve. The channel eastward of the bank is 1,700 yards wide, and that westward of it 1.4 miles wide. Vessels sometimes anchor temporarily on the bank.

**Clearing marks.**—Toward Lighthouse and Castle Toward in range bearing  $291^\circ$ , lead half a mile southwestward of the bank, and The Doon, a remarkable conical hill northeastward of Gareloch Head and 17 miles distant, well open of Cloch Lighthouse, bearing  $22^\circ$ , leads northwestward of the bank.

**Light buoy, buoy.**—A red light and bell buoy, No. 32, showing an occulting white light, is moored on the western side of Skelmorlie Bank, and a black can buoy, No. 33, is moored on the southeastern side of the bank. Vessels should not attempt to pass between these buoys.

**The shore** from the northern outer measured-mile beacon trends northward nearly a mile to Wemyss Bay. At the southern part of this bay is a steamboat pier, and the terminus of the Greenock & Wemyss Bay Railway adjoins it. Wemyss Point, a round projection of the land to the northward of the bay, is steep to at the dis-

tance of 200 yards. From the bight on the northeastern side of the point the shore trends northward  $2\frac{1}{4}$  miles to Cloch Point, with Ardgowan Point and Lunderston Bay, a slight indentation, intervening.

**Lights.**—Two fixed red lights, placed vertically 5 feet (1.5 m.) apart, are shown from Wemyss Bay Pier.

**Ardgowan, Lunderston, and Warden Banks** lie off Ardgowan Point and Lunderston Bay; the 10-fathom (18.3 m.) curve of Ardgowan Bank extends nearly  $\frac{3}{4}$  mile from the shore, and that of Lunderston Bank about the same distance, but from the outer part of Lunderston Bank a narrow neck with 8 fathoms (14.6 m.) of water connects it to Warden Bank. Warden Bank, of rock and sand, extends about 600 yards north-northeast and south-southwest, with a width of 200 yards within the 10-fathom (18.3 m.) curve, and has a least depth of  $5\frac{3}{4}$  fathoms (10.4 m.), from which Cloch Point Lighthouse bears  $49^\circ$ , distant 1.2 miles.

Ardgowan and Lunderston Banks, having mud or sand bottom, and being out of the fairway, are convenient places for vessels to anchor temporarily. There is a depth of over 40 fathoms (73.2 m.) within 400 yards of the western side of Warden Bank. The outer corner of Dunoon Pier in range with Gantock Light Beacon,  $343^\circ$ , leads westward of Warden Bank.

**Cloch Light.**—A flashing white light, 76 feet (23.2 m.) above water, visible 14 miles, is shown from a white tower, 76 feet (23.2 m.) high, on Cloch Point.

A fog signal is sounded from the lighthouse. See Light List.

**The western shore** of the Firth of Clyde from Toward Point trends northeastward 7 miles to the entrance to Holy Loch.

**Inellan Beacon.**—The Bridges, a rocky ledge, extends from the shore 1 mile northeastward of Toward Point and dries for 600 yards offshore at about 2 hours ebb. Inellan Beacon, painted in black and white horizontal stripes and surmounted by a globe, stands on the southeastern part of the ledge, but shoal water extends at least 200 yards outside the beacon, and the intervening shore between it and Toward Point is rocky and foul for the distance of 700 yards. The beacon should not be approached within a quarter of a mile.

**Light.**—A fixed white light, 17 feet (5.2 m.) above water, visible 6 miles, is shown from the pier at Inellan when steamers are expected.

**Gantock Rock**, on the western side of the channel, 4 miles north-northwestward of Inellan Beacon and 600 yards southeastward from Dunoon Point, dries at high-water springs, and from it shallow water extends about 200 yards both eastward and northward. There is a narrow channel with 3 to 7 fathoms (5.5 to 12.8 m.) between it and Dunoon Point.



**Gantock Rock Light.**—A group flashing white light, 42 feet (12.8 m.) above water, visible 10 miles, is shown from a white beacon with tank, 48 feet (14.6 m.) high, on Gantock Rock.

**Buoy.**—A black conical buoy, No. 31, is moored on the northern edge of the shoal.

**Dunoon** (55° 57' N., 4° 55' W.), a town and summer resort, extends, with Kirn and Hunters Quay, about 2 miles along the shore of a rounded promontory on the western side of the Firth opposite Cloch Point, from which it is distant 1½ miles. The population of Dunoon was 6,859 in 1911. The ruins of the ancient castle of Dunoon are situated on a green, rocky knoll. A pier runs out from the shore, and there is a depth of 8 feet (2.4 m.) at low water at its end.

Hunters Quay is on the southwestern side of the entrance to Holy Loch.

**Lights.**—A fixed white light, 16 feet (4.9 m.) above water, visible 6 miles, is shown from the end of Dunoon Pier, and a fog bell is sounded when steamers are expected.

A fixed white light, 15 feet (4.6 m.) above water, visible 5 miles, is shown from a storehouse on Kirn Pier.

A fixed green light, 17 feet (5.2 m.) above water, visible 4 miles, is shown from the jetty at Dunoon.

The eastern shore of the Firth trends eastward from Cloch Point (55° 57' N., 4° 53' W.) nearly 2½ miles to Kempock Point, the western point of Gourock Bay, and it is steep-to at the distance of 200 yards.

**Gourock Bay** is about 1,200 yards across at its entrance and 600 yards deep; it affords anchorage in 12 fathoms (21.9 m.), but the southeastern side of the bay, where the water is shoal, must not be approached. On the western side the reclaimed land extending out to Kempock Point is fronted by wharfage with berths for many vessels, and the railroad station is on the wharf extending to the point. The bay is not much used as a harbor except by passenger steamers and yachts, many of the latter being moored here throughout the winter.

There is a coast guard station at Gourock. Belts and lines are kept here.

The population of Gourock was 10,128 in 1921.

**Lights.**—Two fixed green lights, placed vertically 6 feet (1.8 m.) apart, visible 5 miles, are exhibited from the outer end of Gourock Railroad Wharf at Kempock Point.

Two fixed lights, placed vertically, the lower red and the upper green, and 6 feet (1.8 m.) apart, visible 9 miles, are shown from a post on the head of the pier extending from Whitefarland Point, the eastern point of Gourock Bay.

**Fog signals** are sounded from both points. See Light List.

**The northern shore** of the entrance to the Clyde River,  $1\frac{1}{4}$  miles northward of Gourock Bay, is the southern end of the long promontory of Dumbartonshire which divides Loch Long from Gare Loch; this end is nearly 3 miles in length from Barons Point at the entrance to Loch Long to Rosneath Point, its eastern extremity. The town of Kilcreggan stands near the western end, and the shore, off which the 5-fathom (9.1 m.) curve is distant from 200 to 350 yards, is indented by the two small bays of Kilcreggan and Portkil, divided from each other by Portkil Point.

**Buoy.**—A conical black buoy, No. 29, is moored about 200 yards offshore 400 yards southward of Barons Point.

**Rosneath Patch** ( $55^{\circ} 58' \text{ N.}, 4^{\circ} 47' \text{ W.}$ ), with 8 feet (2.4 m.) of water, lies nearly in mid-channel between Whitefarland Pier and the coast of Dumbarton, leaving a clear channel between it and the southern shore, 1,100 yards. To avoid this patch keep well over on the southern shore, which may be approached off Kempock and Whitefarland Points to 400 yards.

**Light.**—A fixed white light, 19 feet (5.8 m.) above water, visible 9 miles, is shown from a concrete pile beacon on the southern end of Rosneath Patch.

**Light buoy—Buoy.**—A black light buoy, No. 27, showing an occulting white light, is moored on the southern side of Rosneath Patch, and a red conical buoy, No. 28, is moored on its northern side. Vessels should not attempt to pass between these buoys.

**Clearing marks.**—Leven Point just in sight over the land, bearing  $242^{\circ}$ , leads southward; Fort Matilda Flagstaff open a quarter of a point eastward of the peak of Mount Binian leads westward; and the flagstaff open a quarter of a point westward of Mount Binian leads eastward, of Rosneath Patch.

**Powder vessel's buoy.**—A checkered black and red buoy, No. 23, for the use of powder vessels, lies 1,400 yards eastward of Rosneath Patch.

**Caution.**—Vessels are warned not to anchor westward of Rosneath Patch within the area bounded by dashes on the chart, owing to the existence of a telegraph cable.

**Tidal currents—Upper part of the Firth of Clyde.**—The tidal current running northeastward along the eastern shore of the firth passes eastward of the Cumbrae Islands at a greatest rate of 2 knots at springs, while the current which runs from Holy Island toward the west coast of Bute splits off Garroch Head, and its eastern part passes westward of the Cumbrae Islands at a greatest rate of  $1\frac{1}{2}$  knots at springs. These currents unite northward of the Cumbrae Islands, and run at a greatest rate of 1 knot at springs toward the lochs at the head of the firth.

The ingoing current runs during the rising tide, and the outgoing current during the falling tide. In Cumbræ Pass the ingoing current sets eastward, and the outgoing current westward.

**The shore** from Whitefarland Point, the eastern point of Gourock Bay, on which stands Fort Matilda, trends southeastward about 1 mile to Princes Pier at Greenock, and is lined by villas and other buildings.

**Lights.**—Two fixed red lights are exhibited from a pillar and a post, 34 yards apart, in the town of Greenock on the shore half a mile southeastward of Fort Matilda, and in range  $196^{\circ}$ , with Rosneath Patch Lightbuoy bearing  $282^{\circ}$ , mark an area of deep water known as the Hole, about 1,110 yards long from east to west, 600 yards broad, and with a depth of from  $20\frac{1}{2}$  to 37 fathoms (37.8 to 67.7 m.).

These lights also serve the purpose of marking the line which no vessel from a foreign port should cross until after the customs or other statutory examination.

A fixed green light and two fixed white lights, placed in the form of a triangle, with the green light on top, are exhibited at the northern corner of Princes Pier. A fog bell is sounded from the pier. See Light List.

**Greenock Bank** ( $55^{\circ} 57' N.$ ,  $4^{\circ} 44' W.$ ) extends across the entrance to the Clyde River, with the exception of the channel along the southwestern shore, southward of a line drawn eastward from Princes Pier, Greenock, to Ardmore Head on the opposite shore. The water shoals rapidly from 18 to 30 feet (5.5 to 9.1 m.) on the northern side of the bank to from 1 to 3 feet (0.3 to 0.9 m.) on the bank, which dries in places.

**Light buoys.**—A black can light buoy, No. 1, showing an occulting white light, is moored at the northern extremity of the bank known as the Tail of the Bank, 500 yards  $84^{\circ}$  from the northern corner of Princes Pier.

A black can light buoy, No. 2, showing an occulting white light, is moored on the edge of the bank opposite Albert Harbor and 250 yards southward of No. 1 buoy.

**Buoy.**—A black can buoy, No. 22, is moored in 15 feet (4.6 m.) on the northern side of Greenock Bank, 800 yards  $80^{\circ}$  from the northern corner of Princes Pier.

**Tides.**—It is high water, full and change, at Greenock at 0h. 8m.: springs rise 10 feet, neaps  $8\frac{1}{4}$  feet; neaps range  $6\frac{1}{2}$  feet.

**Anchorage.**—The anchorage off the shore northwestward of the Tail of Greenock Bank Buoy varies from 60 to 90 feet (18.3 to 27.4 m.) in depth, and a berth should be selected as convenient, either westward or eastward of the range of the two red lights at Greenock, the usual anchorage being eastward of that range, but large vessels

should anchor westward of it. Vessels should not anchor southward of the line of Darroch Tower in range with the cupola of the Master Mariner's Asylum, 262°.

The holding ground at the Tail of the Bank is not good, and vessels in light trim with patent anchors should keep steam ready in stormy weather.

**Examination anchorage.**—The examination anchorage for vessels entering the Clyde is between Cloch Point Lighthouse and Leven Point northeastward of it, in from 6 to 7 fathoms (11 to 12.8 m.) as charted. The limits are—

On the east.—By a line drawn 322° true from Leven Point for a distance of 1,400 yards.

On the west.—By a line drawn parallel to the above for a distance of 1,700 yards.

On the north.—By a line joining the northern extremities of the above limits.

**Clyde River.**—This river, the first in commercial importance in Scotland, though the third in size, is formed by the confluence of numerous streams in the southern part of Lanarkshire. After running about 100 miles northward and northwestward, passing Lanark, Glasgow, Renfrew, and Dumbarton, it flows into the firth at the Tail of the Bank abreast Greenock.

**Depths.**—A channel with a least depth of 26½ feet (8.1 m.) at low-water springs has been dredged from Princes Pier, Greenock, to Newark Castle, at the upper end of Port Glasgow, a distance of 3¼ miles; it has a least width of 300 feet at the bottom. From Newark Castle to Glasgow, a distance of 18 miles following the course of the river, there is a depth of from 26 to 24 feet (47.6 to 43.9 m.) at low-water springs in the fairway of the channel.

**Navigation.**—The navigation of the river above the Tail of the Bank becomes intricate, and should not be attempted without a pilot. The lights and buoys marking the channel are therefore not described herein.

**Clyde River—Regulations.**—The undermentioned regulations are in force in the Clyde River and Harbor of Glasgow:

**Dredgers—Lights.**—Every dredger moored in the river or Firth of Clyde will, between sunset and sunrise, exhibit three bright white lights, placed athwartships on the top of the framework, not less than 6 feet apart, forming a right-angled triangle. Vessels must pass on that side only which shows the two lights in a vertical line. The lights will be visible at a distance of at least 2 miles. Between sunrise and sunset three black balls or shapes will be shown in place of the three lights.

Vessels must approach and pass the dredger with caution and at reduced speed.

**Speed of vessels passing.**—Wherever the dredging machines, diving bells, or other craft belonging to the trustees may be stationed on the river, or where works are being executed by the trustees, a red flag shall be hoisted upon a pole on the river bank at each end of the station or works, or on the dredging machines, diving bells, or other craft themselves, and the master of any approaching steam vessel, when abreast of the flag nearest to him so hoisted on the bank, or when within not less than 150 yards of the machines, diving bells, or other craft having such flag hoisted, shall reduce the speed of the engines to “dead slow,” until his vessel shall have passed any such dredging machine, diving bells, or craft, or works being executed, at least 50 yards.

Wherever, in order to protect works being executed by the trustees or for other navigation purposes, the trustees shall erect any boards on the banks of the river having the words “dead slow” painted thereon, the same shall be considered as a substitute for red flags and the speed of every steam vessel shall, when approaching and passing such boards, be reduced in the same manner in all respects as if red flags had been exhibited.

The master or other person in charge of any steam vessel passing up or down the river, when approaching the entrance to the Forth and Clyde Canal from the river and the entrance to Bowling Harbor, shall, at least 150 yards from the said entrances, reduce the speed of the engines to “dead slow” until at least 50 yards past said entrance, so as not to cause damage to any vessel lying in said harbor or at the said entrance to canal, or hurt or injury to persons employed thereon.

NOTE.—For the purpose of the above regulations the term “dead slow” is to be considered to represent a speed not exceeding 5 miles an hour.

**Pilots.**—Clyde licensed pilots are stationed at Gourrock Pier. They board vessels off Kempock Point, Gourrock, and pilot them to Greenock, Port Glasgow, the upper reaches of the river, or to Glasgow. They also take vessels down to Little Cumbrae Island, the limit of the pilotage district, and when intimation is given of inward-bound vessels requiring pilots at Cumbrae they meet the vessels there. Telegraphic messages from inbound vessels requiring a pilot should be addressed “Pilotage, Glasgow.” Clyde pilots are also stationed at Glasgow to take vessels down the river to the Tail of the Bank, Kempock Point, or to Cumbrae. Pilotage is compulsory between Glasgow and Kempock Point for merchant vessels over 100 tons gross register, and is compulsory between Glasgow and the Cumbraes Islands for all vessels carrying passengers. Pilots are taken to and from vessels off Kempock point and at the Tail of the Bank and Cumbrae by a steam pilot boat and auxiliary motor boats,

which carry the pilot flag at the masthead by day and the regulation lights for a steam pilot vessel by night.

**Signals.—Vessels aground** or submerged in the channel way of the river between Glasgow and Newark Castle, Port Glasgow, so as to obstruct navigation, exhibit—

By day—Two black balls or shapes, each 2 feet in diameter, placed vertically not less than 6 feet apart, where they can best be seen, but at not less than 20 feet above the hull; and two red flags placed where they can best be seen, but at not less than 20 feet above the hull, one at each end of the vessel, in such position as to indicate as nearly as possible the extent of the obstruction.

At night—Two red lights in the same position as the two black balls, and two white lights in the same position as the two red flags.

If the vessel is submerged to such an extent that the above signals can not be displayed therefrom, boats may be used for such of the lights, balls, or flags as can not be shown from the vessel itself.

Between Newark Castle and the Cumbraes the same rule is in force, with the difference that if a wreck-marking vessel be used there shall be exhibited therefrom, so far as is practicable, the under-mentioned signals:

By day—Three black balls or red flags on a yard about 20 feet above the water, two of such balls or flags being placed vertically, 6 feet apart, on the side on which vessels may pass, and one on the other.

At night—Three red lights in lieu of and in the same positions as the balls or flags.

Where a wreck-buoy alone is used in the channel of the river below Port Glasgow to mark the position of a wreck, it shall be colored green with the word "Wreck" in white letters. When possible, the buoy shall be laid near to the side of the wreck next to mid-channel.

The pilot or other person in charge of a vessel approaching such balls, flags, or lights shall, before attempting to pass the same, ascertain that he can do so with safety.

**Greenock.**—The town of Greenock (55° 57' N. 4° 46' W.) commences near Fort Matilda, and extends southeastward along the river for about 3 miles. The business part of the town is above Princes Pier.

The population was 80,387 in 1921.

**Tidal harbors and wet dock.**—Greenock has 6 tidal harbors or basins, and 1 wet dock. The tidal harbors are the Albert Harbor, with a depth of 14 feet (4.3 m.); West and East Harbors, with a depth of 12 and 13 feet (3.7 and 4 m.), respectively, in their entrances and 10 feet (3 m.) inside; Victoria Harbor, with a depth of 14 feet (4.3 m.) in the entrance and 13 feet (4 m.) inside; Garval Basin,

with a depth of 20 feet (6.1 m.) in the entrance and 20 and 10 feet (6.1 and 3. m.) inside on the south and north sides, respectively; and the Great Harbor, principally for the timber trade, having a length of 1,077 yards, a breadth of 200 yards, and a depth of 14 feet (4.3 m.) at the entrance, and an average depth of 12 feet (3.7 m.) inside, with a river entrance at its eastern end 200 feet wide.

James Watt Dock, a wet dock of  $14\frac{1}{2}$  acres, has entrances both from the Garvel Basin and from the Great Harbor. There is a uniform depth of 22 feet (6.7 m.) in this dock, in which, as the caissons are always closed near high water, vessels lie afloat in from 29 to 32 feet (8.8 to 9.7 m.) water. The entrance from this dock to the Great Harbor is only used to float timber through after discharge from vessels.

**Signals.**—A black ball hoisted at a flagstaff at the entrance to James Watt Dock indicates that vessels can enter.

A fixed light, which shows red when vessels are entering and green when the entrance is clear, is exhibited from a flagstaff on the south-western pier head at the entrance to James Watt Dock. There are no special signals for leaving the dock.

**The channel** fronting the tidal harbors and docks has been dredged to a least depth of  $26\frac{1}{2}$  feet (8.1 m.) in the fairway, which is about 200 yards wide. Its eastern and northern sides are marked by a series of black can light buoys and buoys.

**Lights.**—A fixed white light is shown from the quay in front of Greenock customhouse. A fog bell is sounded from this point.

A group flashing light is exhibited from a beacon 23 feet (7 m.) high in front of Garvel Jetty.

Two fixed white lights, placed vertically 6 feet apart, are exhibited from a post at the western end of Garvel Embankment.

Two fixed red lights, placed vertically 6 feet apart exhibited from a post at the eastern end of Garvel Embankment. There are lights at the entrances to all the docks and harbors. See Light List.

**Supplies.**—Coal, fuel oil, and supplies of all kinds can be obtained to any amount.

**Water.**—Water is laid onto the quays by hydrants and is suitable for all purposes. Vessels at anchor can also be supplied.

**Repairs** can be executed to hull, machinery, and boilers.

**Shipping.**—In 1918, 4,424 vessels of 813,091 tons entered the port (including Port Glasgow).

**True bearings.**—The following true bearings are useful for adjusting compasses at Greenock:

East chimney transit, spire of church  $188^{\circ} 10'$ .

West chimney transit, spire of church  $184^{\circ} 20'$ .

**Storm signals** are exhibited by day from a flagstaff in front of the customhouse.

**Sailors' home.**—There is a sailors' home for the use of seamen.

**Port Glasgow** (55° 56' N., 4° 41' W.), on the southern shore of the Clyde 2 miles above Greenock, with a population of 21,002 in 1915, was the seaport of Glasgow, but since the improvements effected in the navigation of the Clyde the trade which centered in Port Glasgow has gone to the city. There is a depth of 20 feet (6.1 m.) at high-water springs in the entrance to the two large basins of Port Glasgow from the river.

There is a depth of 10 feet (3.1 m.) at low water alongside the wharves in the basins, which are furnished with ample quay and shed accommodations, and have facilities, including a steam crane, for coaling vessels.

The steamboat pier, 1,000 feet long, has a depth of 7 feet (2.1 m.) alongside at low water.

**Communications.**—There is communication by railroad, telegraph, and telephone; and the railroad, which runs onto the quays, connects Port Glasgow with the coal and iron fields of Renfrew, Ayr, and Lanark Shires.

**Trade.**—The principal imports are iron ore, pig iron, and limestone. A considerable amount of coal is exported. The port has extensive timber ponds, shipbuilding yards, and iron and brass foundries.

**Dumbarton**, the chief town of Dumbartonshire, stands mainly on the left bank of the Leven a little above its influx to the Clyde, on the northern shore about 6 miles above Greenock. The population of the town was 17,428 in 1921.

There are two large and important shipbuilding yards, two dock-shaped tidal basins, and a patent slip at Dumbarton. The entrance to the Leven River from the Clyde is just westward of Dumbarton Rock, the width of this channel being 100 feet, with a depth of 11 feet (3.4 m.). The imports are coal, lime, and general merchandise, and the exports machinery.

Water is laid onto the quays of both tidal basins by hydrants.

Supplies for shipping are generally sent from Glasgow.

Dumbarton is connected with the general railroad and telegraph systems.

**Measured distance.**—To the eastward of Dumbarton a distance of 3,040 feet has been measured, marked by two pairs of beacons; the running line is 275° true, with depths of 18 to 25 feet (5.5 to 7.6 m.) at mean low water springs.

**Tidal basins.**—The basin, just northward of Dumbarton Rock, is about 4½ acres in extent, and, running east and west, is about 900



feet long on the southern side, and 630 feet on the northern side. It has a clear navigable width of 205 feet at all states of the tide, and a depth of 19 feet (5.8 m.) at high water.

The small basin at the northern end of the Leven Shipbuilding Yard is 500 feet long, north and south, 150 feet wide, with a depth of 16 feet (4.9 m.) water.

**Tides.**—It is high water, full and change, at Dumbarton at 0h. 20m.; springs rise  $10\frac{1}{4}$  feet.

**Dumbarton Rock**, a double-peaked basaltic eminence, circular in shape, about 300 yards in diameter and 206 feet (62.8 m.) high, stands on the eastern side of the entrance to the Leven, and is so steep as to be inaccessible except by stairs on its southern side.

From the southern side of Dumbarton Rock a pier projects a little below low-water mark a distance of about 230 yards, but it is now disused.

**Dunglass.**—At Dunglass,  $\frac{1}{2}$  mile westward of Bowling, the British Mexican Petroleum Co. have a basin, and vessels proceeding into or out of it shall fly "M" flag by day, or a red light above a white light at night; and no ship shall enter or leave the basin until her signal has been answered with the same flag from a flagstaff on either the east or west pier of the basin, according to the side on which she is to berth.

**Bowling** ( $55^{\circ} 56' N.$ ,  $4^{\circ} 30' W.$ ), about 3 miles above Dumbarton on the northern side of the river, has a good pier harbor, the western part of which is generally occupied by unemployed vessels.

There are two steam cranes for coaling vessels from a railroad siding on the quay, alongside of which there is a depth of about 9 feet (2.7 m.) at low water.

There is communication by river, rail, and canal.

**Tides.**—It is high water, full and change, at Bowling at 0h. 30m.; springs rise 10 feet.

**Repairs.**—There is a shipbuilding yard capable of constructing vessels up to about 1,000 tons, and repairs to hull, machinery, and boilers can be executed.

Supplies for shipping are obtained from Glasgow.

**The Forth and Clyde navigation** connects the Firth of Forth and the Firth of Clyde, and affords a navigable channel for vessels not exceeding 68 feet in length,  $19\frac{1}{2}$  feet in breadth, and  $8\frac{1}{2}$  feet in draft, between the east and west coasts of Scotland. The canal commences at Grangemouth, on the Firth of Forth, crosses the country by Falkirk and Kirkintilloch, and terminates at Bowling, on the Clyde; its length is 35 statute miles.

The average width of the canal is 63 feet at the surface and 30 feet at the bottom; the depth is about  $9\frac{1}{2}$  feet (2.9 m.).

There are 20 locks on the eastern side of the summit level of the canal, giving a rise of  $158\frac{1}{2}$  feet, and 19 locks on the western side, the difference being partly caused by the higher level of the tide at high water in the Clyde than in the Firth. The locks are  $68\frac{1}{2}$  feet long and 19 feet 10 inches wide, with 9 feet 6 inches (2.8 m.) water on the sill, except the lock at Bowling, which is 85 feet long and 20 feet wide, with 10 feet (3.1 m.) on the sill.

The bridges are movable, and vessels with masts can pass freely.

Vessels over  $8\frac{1}{2}$  feet draft can be provided with lighters to take such portion of the cargo as is necessary to lighten. Tables of tolls and regulations can be obtained at the collector's offices at the canal entrance. The canal belongs to the Caledonian Railroad Co.

The Monkland Canal connects with the Forth and Clyde at Glasgow, and runs eastward to Gastsherrie, Dundyvan, and Woodhall, a distance of about 13 statute miles. The locks, a flight of 8 pair, 16 locks, at Blackhill, and a flight of 2 locks at Sheepford, give a rise of 117 feet from Glasgow. Each lock is 70 feet long,  $13\frac{1}{2}$  feet wide, and has 6 feet (1.8 m.) water on the sill. It is used by vessels not exceeding 66 feet in length,  $13\frac{1}{2}$  feet in width,  $4\frac{1}{2}$  feet in draft, and  $7\frac{1}{4}$  feet in height, with a greatest possible load of 60 tons. The bridges are fixed, and vessels with masts can not pass. Horse haulage and steam power are used for traction. The canal belongs to the Caledonian Railroad Co.

The Edinburgh and Glasgow Union Canal commences at Edinburgh and terminates at Camelon, Falkirk, where it joins the Forth and Clyde Canal. The Canal is about  $31\frac{1}{2}$  statute miles in length, and is level except at Camelon, where, by a flight of 11 locks, it rises 113 feet. It is used by vessels not exceeding 66 feet in length,  $11\frac{1}{4}$  feet in width, 4 feet in draft, and  $6\frac{1}{3}$  feet in height, with a greatest possible load of 34 tons. Horse haulage is used for traction. This Canal belongs to the North British Railroad Co.

**Old Kilpatrick—Oil wharf.**—Vessels proceeding to the oil wharf at Old Kilpatrick, on the north side of the river, shall signify their intention by hoisting a signal on the foremast, and keeping it displayed until the vessel is moored alongside, and also when leaving, from the time the vessel starts to unmoor until she is clear of the wharf. The signal by day shall be a red and white pennant (the answering pennant of the International Code) shown 20 feet above deck, and by night, two lights from globular lanterns, 3 feet apart, the upper one red and the lower one white, 20 feet above the deck.

**Rothsay Dock** ( $55^{\circ} 54' N.$ ,  $4^{\circ} 24' W.$ ), a tidal basin, formerly known as Clydebank Dock, situated on the northern bank of the Clyde, nearly opposite the mouth of the Cart River and about  $\frac{3}{4}$  mile below Renfrew, is approaching completion, and is intended exclusively for use in the coal and mineral trades.

The basin has an area of 19½ acres, with a length of inside quays of 1,841 yards, and a riverside quay 199 yards long, providing berths inside for 16 large vessels.

The entrance is 66 yards in width, the outer basin 200 yards square, and the inner basin 578 yards long, tapering in breadth from 100 yards at the end nearer the outer basin to 77 yards at the other end, and the basin has a depth of 36½ feet (11.1 m.) at mean high water springs.

There are 4 coal hoists, about 36 cranes, and 2 transporters, all worked by electric power. Each coal hoist is capable of loading about 800 tons in an hour.

**Signals.**—Vessels about to enter or leave Rothesay Dock hoist on the foremast—

By day a red burgee (International Code signal flag B) at least 20 feet above the deck, or at night a red light placed at least 6 feet above the masthead light.

These signals are shown by upcoming vessels on reaching Dalmuir Lighthouse, by downgoing vessels on reaching Renfrew Ferry, and by outcoming vessels before leaving the berth. They are kept up until the vessel has passed within the dock, or is in the normal position for passing up or down the river.

Signals controlling the entrance to the dock are exhibited near the top of a high latticed post on the eastern side of the entrance, which has a red arm on each side, and at night carries a red or a green light.

When the entrance is clear—

By day the right arm, as seen from the vessel, is lowered to an angle of 45°, or at night the green light is exhibited.

Vessels must not pass in or out when the arms are horizontal or when the red light is exhibited.

**Renfrew**, the county town of Renfrewshire, is situated on the southern side of the river about 4 miles from Glasgow and 11 miles from Port Glasgow. Its population was 29,983 in 1921. It has communication by the Glasgow and Southwestern and the Caledonian Railroads. The harbor, which is up the Pudzeoch Burn, has been dredged to a depth of 15 feet (4.7 m.) and quays have been built.

**Glasgow**, the most important manufacturing and commercial town in Scotland and the largest shipbuilding port in the world, is situated on the banks of the Clyde in the county of Lanark, and it is accessible to vessels of large size. The population was 1,121,842 in 1922.

The Lower Harbor, below the bridges, has 16,609 yards length of quayage, which will accommodate vessels drawing up to 28 feet. The Upper Harbor has 505 yards of quayage, with an average depth alongside of from 18 to 21 feet (5.5 to 6.4 m.) at high water. There

are, belonging to the Clyde Trustees, 44 steam cranes and 50 hydraulic cranes of from 3 to 130 tons.

Of the wharves in the Lower Harbor, Shieldhall Wharf is used chiefly for the timber trade, Merklands Quay for the cattle trade, and Meadowside Quay, on which is a granary with a capacity of 31,000 tons, for the grain trade.

**Consul.**—The United States is represented by a consul and two vice consuls.

**Tidal basins.**—Queen's Dock, a tidal basin with an area of  $33\frac{3}{4}$  acres, has an entrance 100 feet wide, a general depth of 33 feet (10.1 m.) at mean high water springs, and a length of quayage of 3,334 yards. Princes Dock, a tidal basin, with an area of 35 acres, has a depth of from 35 to 38 feet (10.7 to 11.6 m.) and a length of quayage of 7,737 yards. Kingston Dock, a tidal basin with an area of  $5\frac{1}{4}$  acres, has an entrance 60 feet wide, a general depth of from 19 to 23 feet (5.8 to 7 m.) at high water, and 830 yards of quayage. The bed of the river between Port Glasgow and the dock entrances has a depth of 35 to 36 feet (10.7 to 11.0 m.) at mean high water springs.

**Signals.**—Vessels about to enter either Queen's Dock or Princes Dock hoist on the foremast and keep displayed until within the dock:

Queen's Dock.—By day: Flag B, International Code, at least 20 feet above the deck. At night: A red light placed at least 6 feet above the masthead light.

Princes Dock.—By day: Flag N, International Code, at least 20 feet above the deck. At night: Two red lights, placed vertically 6 feet apart, above the masthead light.

The signals controlling the entrance to each dock are exhibited at the top of high latticed post at the pierhead, and are—by day, a red arm on each side; at night, a red and green light.

When the arms of the semaphore are horizontal, or when the red light is exhibited, no vessel is to approach the dock entrance.

The signal for entering or leaving the docks, as seen by an approaching vessel, is—by day, the right arm lowered to an angle of  $45^\circ$ ; at night, the green light exhibited.

**Tides.**—It is high water, full and change, at Renfrew at 0h. 50m.; springs rise 11 feet, and at Glasgow at 1h. 8m.; springs rise  $11\frac{1}{4}$  feet, neaps  $9\frac{1}{4}$  feet.

**Repairs.**—All kinds of repairs can be executed.

**Supplies.**—There is every facility for coaling and taking in fuel oil and supplies of all descriptions are obtainable.

Vessels can also take in fuel oil at Dunglass or elsewhere at their berths in the river, from the British Mexican Petroleum Co.'s barge, which carries 1,200 tons.

**Communication.**—There is communication by the Caledonian, the Glasgow and Southwestern, and the North British railroads, besides by several local lines. The telegraph office at Glasgow is always open.

**Trade.**—The chief exports are cotton, linen, woolen, and jute manufactures, iron, copper, machinery, coal, and chemicals; and the imports are grain, flour, timber, sugar, sulphur, hides, ores, iron, and general goods. In 1909, 11,595 vessels with an aggregate tonnage of 5,532,488 tons entered the port.

**Hospital.**—There is no hospital especially for seamen, but there are several general infirmaries.

**Sailors' home.**—There is a sailors' home for Europeans as well as natives of India, etc.

**Kilbrennan Sound** is the channel between the peninsula of Cantyre and Arran Island. Its southern entrance is nearly 10 miles wide between Ru Staffnage ( $55^{\circ} 22' N.$ ,  $5^{\circ} 31' W.$ ) in Cantyre and Clachog Point in Arran. The width of the sound at Drumadoon Point, 6 miles within the entrance, is  $4\frac{3}{4}$  miles, and between Points Imachar and Cranaig, the narrowest part of the sound, about 6 miles farther in, it is  $2\frac{1}{2}$  miles, whence it opens gradually to a width of a little more than 3 miles between Skipness and An Scriodan, the northern extremity of Arran, where it joins Inchmarnoch Water.

**Exercise ground.**—An exercise ground for submarines has been established in Kilbrennan Sound and the southern approach.

The northern limit is the parallel of latitude  $55^{\circ} 32' N.$  The southern limit is a line joining Pladda and Sanda Islands.

**The western shore** of Kilbrennan Sound from abreast of Otterard Rock trends northeastward about  $7\frac{3}{4}$  miles to Carradale Point.

Kildonald Point, about  $2\frac{1}{2}$  miles northward from Otterard Rock, is salient, and Ross Island, small and 23 feet (7 m.) high, lies about 300 yards eastward of it, with a small sound or boat channel between. There is a good shelter in Ross Bay, northward of Kildonald Point, from southerly or southwesterly winds in 4 to 5 fathoms (7.3 to 9.1 m.).

Pluck Point,  $2\frac{1}{2}$  miles northeastward of Ross Island, is the eastern point of Saddell Bay, which affords shelter from northerly winds, about 600 yards offshore in 5 to 6 fathoms (9.1 to 11 m.), but vessels must be prepared for the heavy gusts which come through the glen at the northwestern side of the bay.

**Carradale Bay.**—The shore from Pluck Point trends northward  $2\frac{1}{4}$  miles to Carradale Bay, and off Whitestone Point, about midway, ledges dry out about 300 yards.

Carradale Bay is about  $\frac{3}{4}$  mile across and recedes about 1,600 yards. It affords good anchorage in from 5 to 7 fathoms (9.1 to

12.8 m.), with very little tidal current, and sheltered from east, through north, to west-southwest winds.

Torrisdale Castle, of a dark stone color and surrounded by plantations, stands, on rising ground, near the western shore of the bay, and Carradale House, a conspicuous white building, stands on the northern shore. A fine stream falls into the northwestern part of the bay. The several bights in the bay are frequented by herring boats during the season, there being many little nooks among the rocks which afford shelter.

Crubon Rock, with  $1\frac{1}{2}$  fathoms (2.7 m.) water, lies 100 yards off the southeastern extreme of Carradale Point. Southward of Carradale Point an overfall forms with the south-going current.

**Light buoy.**—A black can light buoy, showing a white flashing light, is located about 800 yards eastward of Carradale Point.

**Point Cranaig** ( $55^{\circ} 36' N.$ ,  $5^{\circ} 28' W.$ ) lies about 1 mile northward of Carradale Point, and to the northward of it there is good shelter from southwesterly winds in about 7 fathoms (12.8 m.), mud and clay, with the southwestern point of Arran shut in with Point Cranaig. An overfall forms with the north-going current off Point Cranaig, and there is an eddy at the anchorage in smooth water. There is a ferry between Point Cranaig and Arran Island. Steamers from Glasgow call daily.

**Telegraph cable.**—A telegraph cable is laid across Kilbrennan sound between Point Cranaig and the shore about half a mile southward of Imachar Point, and the landing places are marked by beacons surmounted by diamond shapes, painted red and white in horizontal stripes.

**Skipness.**—The shore from Point Cranaig trends northward, and then, in a sweep, north-northeastward to Skipness, the northern entrance point of Kilbrennan Sound, a distance of 11 miles. The shore is fairly steep-to, the 5-fathom (9.1 m.) curve being about a quarter of mile off it in places, but shallow patches extend southwestward from Skipness, the outermost patch, with 2 feet (0.6 m.) water, being distant 600 yards.

Skipness Bay, westward of the point, affords temporary anchorage, sheltered from northerly winds, in 8 to 9 fathoms (14.6 to 16.5 m.), but caution is necessary to avoid the patches.

**Tides.**—It is high water, full and change, at Skipness at 11h. 50m.; springs rise 9 feet, neaps 6 feet.

**Light buoy.**—A black can light buoy, showing a flashing white light, is moored about 700 yards southward of Skipness Point, and marks the extremities of the shoals running out from that point.

**The eastern shore** of Kilbrennan Sound, or the west coast of Arran Island, trends northwestward from Clachog Point  $2\frac{1}{2}$  miles

to Brown Point, and thence northward  $3\frac{1}{4}$  miles to Drumadoon Point.

**Iron Rock Ledges** extend off the shore from about  $1\frac{1}{4}$  miles southeastward to  $\frac{3}{4}$  mile northward of Brown Point to the distance of 1,700 yards. There are three heads which dry at low water, besides other off-lying rocks, and the outer patch, with  $1\frac{3}{4}$  fathoms (3.2 m.) water, 1,800 yards  $178^\circ$  from Brown Point.

**Light buoy.**—A red conical light buoy showing a group flashing white light is moored in 6 fathoms (11 m.) 900 yards  $217^\circ$  from the outer rock, which dries 2 feet (0.6 m.).

**Clearing marks.**—Imachar Bluff Point just open of Drumadoon Point,  $348^\circ$ , leads  $\frac{1}{2}$  mile westward of the ledges; and Pladda Light-house open of the southern coast of Arran,  $100^\circ$ , leads about 400 yards southward of them.

In thick weather caution is necessary when navigating in their vicinity; the lead must then be constantly used, especially when working to windward, and the depths must not be decreased to less than 10 fathoms (18.3 m.).

**Drumadoon Point** ( $55^\circ 31' N.$ ,  $5^\circ 21' W.$ ) is a low rocky spur extending from the base of some columnar cliffs, and to the southeastward of it is Drumadoon Bay, into which Blackwater Foot, a considerable stream, falls.

**Machry Bay.**—The shore from Drumadoon Point trends northward  $6\frac{1}{2}$  miles to Imachar Point, but falls back eastward about 1 mile and forms Machry Bay. The 10-fathom (18.3 m.) curve is in some places only 600 yards off the shore of this bay, and thence the water deepens suddenly, so that vessels anchoring temporarily should get well in on the bank.

**Kings Caves.**—About 1 mile northward of Drumadoon Point are the Kings Caves in the sandstone cliffs forming the sea face of Toranrigh or Kings Hill. The caves are noticeable from a distance; they also possess a historical interest, as they are said to have afforded protection in times of adversity to Robert Bruce and his followers.

**Machry Burn**, off which the stony low-water mark is 300 yards from the shore, flows into Machry Bay nearly  $1\frac{1}{2}$  miles northward of the Kings Caves; and about 2 miles farther northward, off Cots, but close in-shore, is Iorsa Patch, a part of which is awash at low water.

**Whitefarland Bay.**—The shore from Imachar Point trends northward 1 mile to a point, and Whitefarland Bay, northward of the point, affords anchorage in 9 or 10 fathoms (16.5 or 18.3 m.) in southerly winds, 500 yards offshore.

**Whitefarland Bank**, nearly 1 mile in length, runs parallel with the shore northward of Imachar Point, from which it is distant

$\frac{1}{2}$  mile. The depths on the bank vary from 14 to 19 fathoms (25.6 to 34.8 m.), and an overfall forms with the south-going current.

**Erins Bank**, westward of Whitefarland Bank and nearly in mid-channel, is a patch of 5 fathoms (9.1 m.), with depths of from 17 to 20 fathoms (31.1 to 36.6 m.),  $\frac{1}{4}$  mile northward and  $\frac{1}{2}$  mile southward of it; bottom, gravel. The water suddenly deepens eastward and westward to 25 and 30 fathoms (45.7 and 54.9 m.). A heavy overfall forms on the bank during the south-going current.

**Catacol Bay**.—Areverga Point is  $2\frac{3}{4}$  miles north-northeastward of Whitefarland Bay, and from it the shore turns eastward and forms Catacol Bay, which affords shelter in southerly winds in from 8 to 10 fathoms (14.6 to 18.3 m.) water.

**Loch Ranza** ( $55^{\circ} 43' N.$ ,  $5^{\circ} 18' W.$ ),  $1\frac{1}{2}$  miles northeastward of Catacol Bay, is an inlet about  $\frac{1}{2}$  mile in length southeastward and  $\frac{1}{4}$  mile broad. It affords good anchorage to small vessels with winds from west-southwest through south and east, to north, but northwesterly winds cause a considerable sea and render the anchorage uneasy. The entrance is between Coillemore Point on the southwest and Newton Point on the northeast. A pier with a cross arm, having a depth of 13 feet (4 m.) at its head, extends northeastward from Coillemore Point.

Steamers from Wemyss Bay call regularly, and the loch is frequented by herring boats during the season.

**Light**.—A small fixed red light is exhibited from the head of the pier.

**Anchorage**.—Anchor in the middle of the loch off the old castle in 5 to 8 fathoms (9.1 to 14.6 m.) During southerly gales heavy gusts sometimes sweep down the ravine with sufficient violence to drive a vessel out of the loch.

In entering keep Coillemore Point aboard, as Screda Reef, a rocky ledge, extends about 200 yards from the northeastern point.

**Tidal currents in Kilbrennan Sound**.—The currents through Sanda Sound turn into and out of Kilbrennan Sound, the north-going current running from  $5\frac{1}{2}$  hours before until high water, and the south-going from half an hour after high water until  $5\frac{1}{2}$  hours before the following high water. The rate of these currents in the main channel is about  $2\frac{1}{2}$  knots at springs, but it is much greater off the salient points or over shoal water. Off the southeastern part of Davarr Island the currents have a rate of 4 knots, and the south-going current causes a race and overfalls, especially when it is opposed by the wind; the rate of the current increases around Skipness, and there is an overfall off Cranaig Point. In the bays, such as Kildalloig, Saddell, Carradale, Sunidale, Clunaig, and Skipness Bays, there is but little current, although there may be a slight



eddy with either the north-going or the south-going current in Kilbrennan Sound.

The north coast of Arran Island from Newton Point trends northeastward and eastward for about 1 mile to An Scriodan, a rounded headland, and about  $\frac{1}{2}$  mile farther eastward is The Cock of Arran.

**Bute Sound**, the channel between Arran and Bute Islands, is nearly 5 miles wide. The water is deep and clear of shoals in the fairway.

The southwestern shore of Bute Sound, or the northeastern coast of Arran Island, is steep-to.

**The northeastern shore.**—**Garroch Head** ( $55^{\circ} 44' \text{ N.}, 5^{\circ} 02' \text{ W.}$ ), the southern point of Bute Island, is steep-to, but it should be given a good berth to avoid the race off it.

The shore from Garroch Head trends northwestward  $4\frac{1}{4}$  miles to Ardscaipsie Point. At a little over 1 mile from the head the land falls back eastward, and thence to the point are several bays where temporary anchorage can be obtained.

**Whiting Bank**, 2 miles  $280^{\circ}$  from Garroch Head, has depths of from 13 to 17 fathoms (23.8 to 31.1 m.) and 21 to 40 fathoms (38.4 to 73.2 m.) around.

**Scalpsie Bank**,  $1\frac{1}{4}$  miles northward of Whiting Bank, has depths of from 8 to 10 fathoms (14.6 to 18.3 m.) and 12 to 25 fathoms (21.9 to 45.7 m.) around.

**Inchmarnoch Water** lies between Kilbrennan and Bute Sounds on the south and Loch Fyne and West Kyle on the north.

**Inchmarnoch**, an island 1.7 miles long north and south,  $\frac{1}{2}$  mile wide, and 185 feet (56.4 m.) high, is separated from Bute Island by Inchmarnoch Sound, which is 1,200 yards across, with deep water throughout, except on Shearwater Rock.

**Shearwater Rock**, with  $1\frac{1}{4}$  fathoms (2.2 m.) water, lies in the middle of the southern entrance to the sound, with Ardscaipsie Point bearing  $91^{\circ}$  distant 1,300 yards, and the passages on either side of it are nearly  $\frac{1}{2}$  mile wide.

**Clearing marks.**—Sgat More or Skate Island in Loch Fyne, open westward of Inchmarnoch,  $312^{\circ}$ , leads southwestward; North Park of Inchmarnoch open on the eastern side of the island,  $334^{\circ}$ , leads eastward; and Kingarth Church, Bute, in range with Ardscaipsie Point,  $105^{\circ}$ , leads northeastward of Shearwater Rock.

**St. Ninian Bay** extends northward  $\frac{1}{2}$  mile within St. Ninian Point ( $55^{\circ} 48' \text{ N.}, 5^{\circ} 08' \text{ W.}$ ) on the eastern side of Inchmarnoch Sound. It is well sheltered by Inchmarnoch, has a broad sandy beach, and is much resorted to by boats during the fishing season. There is no pier, but landing is effected at low water among the rocks.

**The coast of Bute Island** trends northward from St. Ninian Point  $2\frac{1}{4}$  miles to the southern point of Etterick Bay and is bold throughout, the 5-fathom curve (9.1 m.) being not more than 300 yards distant from it.

**Tidal currents—Bute Sound and Inchmarnoch Sound.**—The current setting north-northeastward from Holy Island splits on Garroch Head, and the western portion runs along the west coast of Bute through Inchmarnoch Sound for the West Kyle. The current sets northward during the rising tide, and to the southward during the falling tide.

The rate of these currents is 1 to  $1\frac{1}{2}$  knots along the west coast of Bute, and 2 knots through Inchmarnoch Sound at springs. Westward of Inchmarnoch there is an area, between the current running through Kilbrennan Sound for Loch Fyne and the current running along the west coast of Bute, where the currents are very weak.

**Loch Fyne** entrance is between Skipness in Cantyre and Ardlamont Point,  $5\frac{1}{2}$  miles to the northeastward. The loch takes a northerly direction for 13 miles to a promontory, where it bifurcates, Loch Gilp, the western branch, running northward about  $2\frac{1}{2}$  miles and the main branch running northeastward 22 miles.

Loch Fyne is navigable throughout its entire length, a distance of 35 miles, its waters being deep and its shores generally steep-to and clear from off-lying shoals. The loch has herring, haddock, whiting, ling, and codling fisheries, the most valuable being the herring fishery.

**Tides and tidal currents.**—It is high water, full and change, at the entrance to Loch Fyne at 11h. 50m.; springs rise 9 feet, neaps 6 feet.

The tidal currents in Loch Fyne do not exceed a rate of 2 knots at springs, excepting in two places—abreast of Otter Spit and abreast of Minard Bay. Through the Otter Spit Narrows the north-going current runs from 6 hours before to 1 hour before high water at a greatest rate of  $3\frac{1}{2}$  knots at springs, and the south-going current runs from 1 hour before until 6 hours after high water at a greatest rate of  $5\frac{1}{2}$  knots at springs. With the north-going current an eddy forms on the northern side of Otter Spit, which extends 600 to 800 yards offshore. Between Otter Spit and Minard Narrows both currents slacken, but at Minard Narrows the rate of the north-going current is  $2\frac{1}{2}$  knots at springs, and the rate of the south-going current 4 knots. Off Inveraray the north-going current has decreased to  $1\frac{1}{4}$  knots and the south-going current to  $1\frac{3}{4}$  knots at springs. The in-going current throughout Loch Fyne, with these exceptions, runs during the rising tide, and the out-going during the falling tide at a greatest rate of 2 knots, strongest off the salient points and weakest in the bays between them, so that there is very little stream in

Loch Gilp, etc. At neaps the rate of the currents is about half of that at springs.

**The eastern shore** of Loch Fyne from Ardlamont Point ( $55^{\circ} 50' \text{ N.}, 5^{\circ} 12' \text{ W.}$ ) to Sgat More or Skate Island trends northwestward about  $3\frac{1}{2}$  miles, and in the intervening shore are Ardlamont, Kilbride, and Asgog Bays, which afford good temporary anchorage with northerly or easterly winds.

Sgat More, or Skate Island, is about 200 yards in extent and covered with grass, 31 feet (9.4 m.) high, and is separated by a deep passage 300 yards wide from Eilean Aoidhe, which is connected to the mainland. The western side of Sgat More is steep-to, but a rock, which dries at two-thirds ebb, lies 200 yards, and a patch of 3 fathoms (5.5 m.) nearly 300 yards, southeastward of the island.

**Light.**—A flashing white light, 30 feet (9.1 m.) above water and visible 8 miles, is shown from an iron tank on the southern end of Sgat More Islet.

Stillaig Point is 600 yards northward of Duncan Head, the western end of Eilean Aoidhe, and from it the shore, greatly indented, trends northward about 2 miles to Rudha Presachan (Preasach): nearly midway between these points is Eilean Buidhe, a small islet steep-to on its western side, but shoal water, with a small rock awash, extends nearly 200 yards eastward from it. There are several bights on this shore suitable for temporary anchorage, and Black Harbor is situated about 800 yards northward of Rudha Presachan (Preasach) within Eilean Buidhe and some rocks.

Stillaig Point, open of Eilean Buidhe,  $148^{\circ}$ , leads westward of Buck Rock 800 yards northward of Eilean Buidhe and at the entrance to Buck Bay, and westward of Sgeir an Eoine at the entrance to Black Harbor, but both these rocks cover only at high water springs.

The shore from Rudha Dubh, a little northward of Black Harbor, trends northward to abreast of the end of the promontory where the loch bifurcates. It also is indented, and the bays, which afford temporary anchorage with offshore winds, may be approached with the plan as a guide.

**The western shore** from Skipness trends northeastward  $1\frac{1}{4}$  miles to Sgeir Buidhe, and then turns gradually northward nearly 6 miles farther to East Loch Tarbert; it is but slightly indented and steep-to.

**East Loch Tarbert** extends westward about  $\frac{3}{4}$  mile, and it is separated by a neck of lowland 1 mile in breadth from West Loch Tarbert.

Cock Island ( $55^{\circ} 52' \text{ N.}, 5^{\circ} 24' \text{ W.}$ ) lies nearly 800 yards within the entrance, and a reef, with two rocks which cover at half flood,

projects for about 200 yards northwestward from it. Two channels, one on each side of Cock Island, lead into the inner loch; the southern, which is the wider and deeper, is about 60 yards wide, with a least depth of  $2\frac{3}{4}$  fathoms (5.0 m.).

There are depths of from 14 to 7 fathoms (25.6 to 12.8 m.) in the outer loch, and of from  $2\frac{1}{2}$  to 5 fathoms (4.6 to 9.1 m.) mud, in the inner loch, which is about 300 yards long and 200 yards wide. Sailing vessels, except those of small size, require a leading wind to enter or leave the inner loch.

There is a pier, with a depth of 20 feet (6.1 m.) alongside it, on the southwestern side of the outer loch.

The ruins of Tarbert Castle, partially covered with ivy, are on a height on the southern side of the inner loch, and immediately below the ruins is a quay, with 6 feet (1.8 m.) water alongside it at low water, where steamers discharge cargo. East Loch Tarbert is the headquarters of the Loch Fyne herring fishery. Steamers ply regularly between Glasgow and East Loch Tarbert, goods and passengers being taken across the isthmus to West Loch Tarbert, whence there is communication by steamer with Islay and Jura.

**Lights.**—A fixed green light, known as *Madadh Maol*, is shown from the center of the quay northward of the castle; also a fixed white light with red sector is shown from the perch off the point on the southern side of the entrance, southeastward of Cock Island.

**Buoys.**—A black barrel buoy is moored on the southern side of a rocky ledge extending about 30 yards southward from Cock Island.

A black barrel buoy is moored on the southern extreme of the reef within Cock Island.

A buoy is moored on the end of a spit extending from a point on the northern side of the loch northward of Cock Island.

A buoy is moored on the northwestern extremity of the reef within Cock Island.

**Tides.**—It is high water, full and change, at East Loch Tarbert at 11h. 53m.; springs rise 9 feet, neaps 6 feet.

**Measured distance—Loch Fyne, western shore.**—A measured mile is laid out along the coast northward of East Tarbert. It is marked at its southern end by two white posts, the outer being on the extremity of Garvel Point. The central point of the mile is marked by white pole beacons, and the northern end by white posts. The leading mark for running to the southward is a white beacon on Battle Islet in range with the white beacon on the extremity of Maol Darach, bearing  $151^\circ$  true, ahead. The northern portion of the distance is 3,038 feet, the southern 3,041 feet, together 6,079 feet.

**The western shore** of Loch Fyne from Garval Point ( $55^\circ 52' N.$ ,  $5^\circ 24' W.$ ), the northern entrance point of East Loch Tarbert, trends northward about 1 mile to Barmore Peninsula, which is connected to

the main by a narrow isthmus. The bights within the peninsula and on each side of the isthmus might afford temporary anchorage. About 200 yards eastward of the middle of the peninsula is Sgeir na Bo, a small rock which covers at springs; about 200 yards to the northward is Sgeir Leathann, a rock which never covers; and 400 yards further northward and 250 yards from the northeastern point of the peninsula is Caena Maol, a small rock, which covers at half tide and is surrounded by deep water.

The shore from Barmore Isthmus trends northward about 4 miles to Maol Dubh Point, and thence, after a slight bend to the westward, continues another 5 miles in the same direction to the head of Loch Gilp. Northward of Maol Dubh the shore is fringed by shoals extending off nearly 250 yards in places, and there are also several detached shoal patches in the fairway to or from Ardrichaig. For their relative positions see chart.

**Big Rock**, with  $1\frac{1}{4}$  fathoms (2.2 m.) water, lies 1,500 yards  $26^\circ$  from Maol Dubh Point, and on the southern side of a bank, which within the 10-fathom (18.3 m.) curve is 800 yards in extent; a patch of 5 fathoms (9.1 m.) lies northeastward nearly 600 yards from Big Rock.

**High Rock**, 1.3 miles  $63^\circ$  from Maol Dubh Point, is small and has 5 fathoms (9.1 m.) water.

**McLarty Rock**, 800 yards  $8^\circ$  from High Rock, is also a small patch with 5 fathoms (9.1 m.) water.

**The Knows** are two patches with  $4\frac{1}{2}$  and 4 fathoms (8.2 and 7.3 m.) water, respectively, situated 1 mile  $213^\circ$  and 1,200 yards  $193^\circ$  from Liath Eilean, on the western side of the entrance to Upper Loch Fyne.

There is deep water around these rocks.

**Leading mark**.—Oakfield House (in a wood) in range with the eastern side of Dunchoan Island,  $350^\circ$ , leads nearly 200 yards eastward of Big Rock and Bank; it also leads westward of High and McLarty Rocks and of the Knows.

**Loch Gilp**, the western branch of Loch Fyne, is about  $2\frac{1}{2}$  miles deep, but flats, dry at low water, extend 1 mile from its head. There is a depth of 11 fathoms (20.1 m.) in the entrance to the loch, but it decreases to 5 fathoms (9.1 m.) a little southward of Sgeir Sgalag, and off Ardrishaig village there are from  $4\frac{1}{2}$  to  $2\frac{1}{2}$  fathoms (8.2 to 4.6 m.). Ardrishaig village, with a population of 1,297 in 1911, is about halfway up the loch on its western side, and there are numerous villas along the shore to the southward of it. Lochgilp-head village, with a population of 921, is situated at the head of the loch.

There is communication between Ardrishaig and Greenock twice daily in summer and once daily in winter (Sundays excepted).

The southeastern end of the Crinan Canal, which is 9 miles in length, and connects Loch Fyne with Loch Crinan in the Sound of Jura, is at Ardrishaig. The lock at the Ardrishaig Entrance admits vessels drawing 9 feet (2.7 m.) water from three hours before to three hours after high water. Vessels waiting tide to enter either bring up just inside the breakwater or lie at the pier, where there is a depth of 9 feet (2.7 m.) at low water.

The breakwater runs in a general easterly direction for a distance of about 240 yards from the shore just southward of the canal entrance, and there is a lighthouse at its head.

**Light.**—A flashing light, with red, white, and green sectors, 30 feet (9.1 m.) above water, visible 4 miles, is shown from a stone tower, 19 feet (5.8 m.) high, on the outer end of Ardrishaig breakwater.

**Shoals and buoys.**—About  $\frac{1}{2}$  mile southeastward from Tign n Coille, on the western shore at the entrance of the loch, is a shoal with  $3\frac{1}{2}$  fathoms (6.4 m.) least water.

About 400 yards eastward of Tign n Coille is a small patch with 4 feet (1.2 m.) water, and a black can light buoy showing a flashing white light is moored 150 yards eastward of it.

Rocks, with  $2\frac{1}{2}$  fathoms water (4.6 m.), extend about 100 yards southeastward of this shoal.

**Sgeir Sgalag**, situated about 900 yards  $152^\circ$  from the end of the breakwater, and in the fairway to Loch Gilp, is about 200 yards in extent and has a least depth of 1 foot (0.3 m.).

The white sector of the breakwater light clears this shoal at night.

**Buoys.**—A red conical buoy is moored westward of the southern end of Sgeir Sgalag in  $2\frac{1}{2}$  fathoms (4.6 m.) and a red conical buoy is moored on the western edge of the shoal in  $3\frac{1}{4}$  fathoms (5.9 m.).

**Dunchoan Island** is a cluster of bare rocks, a few feet high, standing on a shoal  $\frac{1}{4}$  mile in length, northeast and southwest, situated on the eastern side of the fairway into Loch Gilp, the channel between the shoal extending southwestward from it and Sgeir Sgalag being 150 yards wide, with 4 fathoms (7.3 m.) water.

**Beacon.**—A rock that dries 9 feet (2.7 m.), nearly 200 yards inside the southwestern end of the shoal extending from Dunchoan Island, is marked by an iron perch.

**Anchorage.**—The best anchorage in Loch Gilp is in  $3\frac{1}{2}$  to 4 fathoms (6.4 to 7.3 m.), about 400 yards northward of Dunchoan Island, which affords shelter from southerly winds.

**Tides.**—It is high water, full and change, at Ardrishaig at 11h. 53m.; springs rise 9 feet, neaps  $7\frac{1}{2}$  feet. The tide reaches the jetty at Lochgilphead about 2h. 45m. after it begins to rise at Ardrishaig, and there is a depth of about 5 feet (1.5 m.) alongside it at high-water springs.

**Directions.**—It is advisable for vessels to pass westward of Sgeir Sgalag, between the red conical buoys marking that shoal and the black can buoy marking the 4-foot (1.2 m.) patch near the western shore. When westward of the buoy marking the western extremity of Sgeir Sgalag steer northward and anchor as convenient.

**Upper Loch Fyne.**—Loch Fyne, above the promotory where it bifurcates, becomes much contracted, the least width of the channel between Otter Spit on the east and Creag Gobhainn and Glas Eilean on the west and north, being 800 yards, and though it opens out somewhat afterwards, the average width of the upper loch is not more than 1,600 yards.

**Otter Spit,** of sand and gravel, extends  $\frac{3}{4}$  mile northwestward from the eastern shore just within the entrance to the upper loch. It is triangular in shape, the base being along the shore. The southwestern side of the spit shoals quickly, but the northeastern side is steep-to, its edge covering only at high water. The narrows, the navigable channel between the spit and the opposite shore, is 1,000 yards across, with depths of from 7 to 22 fathoms (12.8 to 40.2 m.).

**Light.**—A flashing white light, 23 feet (7 m.) above water, visible 9 miles, is shown from a red beacon surmounted by a spherical cage, 34 feet (10.4 m.) high, on the northwestern extremity of Otter Spit, with deep water close to.

**Ferry.**—A ferry crosses the loch from a pier in Otter Bay to a quay at West Otter, half a mile from Lagnahulen Bay.

**Light.**—A fixed red light is shown from the end of the ferry pier in Otter Bay.

**Anchorage.**—There is good anchorage 200 yards off the ferry pier in Otter Bay in 5 to 6 fathoms (9.1 to 11 m.).

**Lagnahulen (Lagnahuillidh) Bay,** on the northwestern side of the loch, northward of Otter Beacon, is small, but affords good anchorage in 7 to 8 fathoms (12.8 to 14.6 m.), out of the tidal currents. Glas Eilean lies off the eastern point of the bay; the passage between it and the northern shore is narrow but clear, the least water in mid-channel being 5 fathoms (9.1 m.).

**Kames Bay,** on the northwestern shore of the loch, about 2 miles above Glas Eilean, affords good anchorage in 8 fathoms (14.6 m.), sand and gravel, out of the strength of the currents, but it should be approached carefully with the lead, as the sand dries out 200 yards from the western shore of the bay at low water.

**Loch Gair** (56° 04' N., 5° 20' W.), a small basin with a narrow entrance just above Kames Bay, affords complete shelter to vessels of 12 feet (3.7 m.) and less draft. The entrance, on the western point of which is a square tower, is less than 400 yards across, but the navigable channel, with a least depth of  $2\frac{1}{2}$  fathoms (4.6 m.) is

contracted to about 100 yards width by a shoal flat extending from each shore.

**Minard Narrows** are about  $6\frac{1}{2}$  miles above Otter Spit Beacon, and the water is deep on both the intervening shores of the loch at the distance of 300 yards. Two islets and several rocks form the narrows, Eilean Aoidh, or Lamb Island, the larger of the islets, being about 40 feet (12.2 m.) high, with shoal rocky ground north-eastward of it, terminating at the distance of 400 yards in North Rock with 1 fathom (1.8 m.) water. Fraoch Eilean, the smaller islet, is close southwestward of Eilean Aoidh, and is steep-to.

Gortan Point open southeastward of Eilean Aoidh,  $210^\circ$ , leads southeastward, and the ruins of Lachlan Castle in range with the northern end of Paddy Rock,  $88^\circ$ , leads northward of North Rock.

North Rock is covered by the red sector of Paddy Rock Light.

**Paddy Rock**, nearly midway between North Rock and the ruins of Lachlan Castle on the eastern shore, is about 15 feet (4.6 m.) high, with shoal ground extending 150 yards southward from it, and a clear deep passage on either side.

**Light.**—A flashing white light with red sectors, 22 feet (6.7 m.) above water, visible 9 miles, is shown from an iron latticework beacon, 15 feet (4.6 m.) high, on Paddy Rock.

**Otter Rock—Beacon.**—Otter Rock lies 300 yards northwestward of Eilean Aoidh, and from it a bank of gravel extends northwestward 300 yards, its end being marked by a red beacon surmounted by a spherical cage, between which and Brainfort Point, on the northwestern side of the loch, the channel is 300 yards wide, with depths of 10 to 11 fathoms (18.3 to 20.1 m.).

**Minard Bay**, on the shore of the narrows, westward of Fraoch Eilean, is wooded, and Minard Castle, a handsome modern structure, stands on its southern point. The bay is much frequented by herring boats during the season.

**Big Shoal**, a patch with 3 fathoms (5.5 m.) water, is situated about 1,300 yards north-northeastward of Paddy Rock and a quarter of a mile off the southeastern shore. Otter Rock Beacon, in range with Minard Castle,  $223^\circ$ , leads northwestward of the shoal.

**The shore** of the loch above Minard Bay, on the northwestern side, is covered with oak woods varied by clumps of firs; but that on the southeastern side has occasional plantations only.

The loch above Minard Narrows is very deep even close to the shore, so that there are few places suitable for anchorage.

**Inveraray.**—In approaching Inveraray ( $56^\circ 14' N.$ ,  $5^\circ 04' W.$ ), on the northwestern side of the loch below Loch Shira, a small bay, avoid Otter Spit, which extends nearly 400 yards offshore abreast of the southern side of the town. The spit is marked by a buoy;



but the bridge near the castle, open of the end of the pier, 2°, leads eastward of it.

**Lights.**—Two fixed red lights are shown from lamp-posts on Inveraray Pierhead and three fixed white lights from lamp-posts on the pier.

**Anchorage.**—The anchorage off Inveraray is about 400 yards eastward of the pier and the same distance from the shore near the castle; but the water is deep, and southwesterly winds cause an unpleasant sea.

**Tides.**—It is high water, full and change, at Inveraray at 0h. 0m.; springs rise 10 feet, neaps 7 feet.

**The town** of Inveraray, the county town of Argyllshire, is situated amidst very fine scenery. Inveraray Castle, the seat of the Duke of Argyll, a little to the northeastward of the town, is surrounded by dark woods. About  $\frac{1}{2}$  mile farther northeastward the peak of Duniquoich rises abruptly to a height of 700 feet (273.4 m.) from the shores of the loch and is surmounted by a tower.

The town is small, its population being 1,103 in 1921. The chief employment is the herring, cod, and ling fishery. There is communication by steamer twice weekly with Glasgow. The nearest railroad station is at Dalmally, 16 miles to the northeastward.

A steam ferry plies across the loch between Inveraray and St. Catherines on the opposite shore.

**The head of the loch.**—The distance from Strone Point ( $56^{\circ} 14' \text{ N.}, 5^{\circ} 03' \text{ W.}$ ), the eastern point of Lock Shira, to the pier at St. Catherines is  $\frac{3}{4}$  mile. and from this line to the head of Loch Fyne  $4\frac{1}{2}$  miles. The water is deep and not suitable for anchorage, except off Lowburn, near the loch head.

**Kyles of Bute.**—The Kyles of Bute are the channels passing around the northern part of Bute Island and separating it from Argyllshire. They are divided into West Kyle and East Kyle, the two channels meeting at the northern end of Bute.

**West Kyle.**—The entrance to the West Kyle from Inchmarnoch Water is upward of 2 miles wide between Ardlamont Point, the southern extremity of the land dividing the Kyle from Loch Fyne, and the opposite coast of Bute, the channel trending northward  $4\frac{3}{4}$  miles, with a general navigable width of about 1,200 yards, and then turning abruptly northeastward about  $2\frac{1}{4}$  miles, with a width varying from 600 to 350 yards, to its junction with the East Kyle. Within the entrance the water is deep, the general depths in the fairway being from 39 to 18 fathoms (71.3 to 32.9 m.) and no shoals extend more than 200 yards from the shore except off Ardlamont Point, and for  $2\frac{1}{2}$  miles northward of that point, where the shore should not be approached within 500 yards.

**Etterick Bay**, just within the West Kyle on the coast of Bute, is 1,600 yards across between its entrance points, with depths of 10 to 5 fathoms (18.3 to 9.1 m.), sandy bottom, but the head of the bay dries nearly a quarter of a mile, and is shoal for another 200 yards. It is frequented by trawling boats, but seldom used as an anchorage, as it is open from west to southwest.

The coast of Bute from Etterick Bay trends northward to Rudha Dubh (Black Point) ( $55^{\circ} 54' N.$ ,  $5^{\circ} 13' W.$ ), the northwestern point of the island, and is so steep-to as to be unsuitable for anchorage; from Rudha Dubh it trends northeastward nearly 2 miles to Buttock Point, its northern extremity.

**Buoy.**—A black buoy is moored about 400 yards southward of Rudha Dubh.

**Ardlamont Point** is low and rugged, and eastward of it is a rocky ledge terminating in Am Brideum (Breedhook Rock), which uncovers at two-thirds ebb. The ferry house near Kilmichael, in Bute, open eastward of the land northward of Ardlamont Point,  $351^{\circ}$ , leads eastward of the rock.

**Light buoy.**—A red conical light buoy, No. 47, showing an occulting white light, is moored on the eastern side of Ardlamont Ledge, about 200 yards southeastward of Am Brideum.

**Blindman Bay**, 1 mile northward of Ardlamont Point, affords anchorage for fishing smacks, the best berth being on the southern side of the bay off a few cottages, where the bottom is fine white sand. Should the wind freshen from southward of south-southwest, the smacks run under Carry Point, the northern point of the bay, where they can generally hold on.

Carry Rock, a group of large stones, which only covers at very high tides, lies about 100 yards off Carry Point, and the depth is less than 5 fathoms (9.1 m.) for 400 yards off the point.

**Light buoy.**—A black can light buoy, No. 46, showing a group flashing white light, is moored on the edge of the shoal water about 400 yards eastward of Carry Point.

**Kames.**—The shore from Carry Point trends northward  $2\frac{1}{2}$  miles to Kames, a summer resort with a good landing pier. In places the shore dries out from 200 to 250 yards.

From Kames the shore turns gradually northeastward toward Rudha Ban (White Point), where is the narrowest part of the West Kyle, a low-water tongue extending 200 yards from the point into the channel, and reducing its navigable width to rather less than 350 yards.

There is a landing pier at Tignabruaich, 1,200 yards southwestward of Rudha Ban, where steamers from Glasgow call daily.

There is said to be good anchorage for small craft 300 yards from the shore between Kames and Tignabruaich, and there is a pier at Achanlochan,  $\frac{1}{2}$  mile northeastward of Kames.

**Lights.**—Lights are shown from Kames, Achanlochan, and Tignabruaich Piers when steamers are expected.

**Telegraph cable.**—A telegraph cable is laid across the West Kyle from the shore about 300 yards westward of Rudha Ban in a  $144^{\circ}$  direction. Both landing places are indicated by posts marked "Telegraph cable."

**The shore** from Rudha Ban ( $55^{\circ} 55' N.$ ,  $5^{\circ} 12' W.$ ) trends northeastward, and is steep for 1 mile to Eilean Dubh, a small island on the western side of the entrance to Loch Riddon, within which is a very contracted but snug anchorage for small vessels in 2 fathoms (3.7 m.) water.

**Beacons.**—A conspicuous white beacon stands on the southeastern point of Callow Peninsula, which lies immediately westward of Eilean Dubh.

A small white beacon stands on the northwestern end of Eilean Dubh.

**Loch Riddon.**—The entrance to Loch Riddon lies between Eilean Dubh and Rudha na Moine, 800 yards eastward. The loch trends northeastward, and has a navigable width of 450 yards, with depths of from 30 to 7 fathoms (54.9 to 12.8 m.) for  $1\frac{1}{2}$  miles, above which it dries for a similar distance to its head. It is seldom visited.

Fearn-ach Bay, northward of Rudha na Moine, affords temporary anchorage in a moderate depth of water 200 yards from the shore; and there is also anchorage southward of Craig village in about 8 fathoms (14.6 m.).

**Rothsay Sound**, situated between the southern end of that part of Argyllshire which borders the Clyde and Bute Island, is the channel leading to the East Kyle and also to Loch Striven.

The entrance to the sound is between Bogany and Toward Points.

The sound trends northwestward about 3 miles to Armaleish Point, and has a least navigable width of 1,400 yards between Bogany Point and Toward Bank, and between Ardbeg and Ardyne Points, with general depths in mid-channel of from 24 to 30 fathoms (43.9 to 54.9 m.).

The northeastern shore of the sound from Toward Point to Ardyne Point,  $2\frac{1}{2}$  miles northwestward, is foul for distances of from about half a mile to 300 yards.

**Kames Bay**, on the western side of the sound, northward of Ardbeg Point, is about 1 mile wide at its entrance, three-quarters of a mile deep, and has depths of from 17 to 6 fathoms (31.1 to 11 m.) but there are depths of less than 5 fathoms (9.1 m.) and foul ground for 400 yards off its shore in places.

On the southern shore of the bay is the village of Kamesburgh (Port Bannatyne), which is connected to Rothesay by electric car line.

A wooden pier extends 220 feet off the town, and has a depth of 10 feet (3 m.) at its head, at which passenger steam vessels call.

**Buoys.**—A red mooring buoy marked "G. & S. W. R.," is moored about 200 yards off the pierhead, and there are several mooring buoys for yachts at the head of the bay.

**Slips.**—Westward of the pier is a yacht-building yard, with a small slip, and on Undraynian Point, the northern point of the bay, is a slip capable of taking up a vessel of 200 tons.

The bay is frequented by yachts during summer, but easterly gales cause an unpleasant sea.

**East Kyle,** the channel between the northeastern part of Bute Island and Argyllshire, is  $4\frac{1}{4}$  miles in length. The water is deep at a moderate distance from the shore, and the navigable channel is about 600 yards wide, but it narrows to 300 yards abreast of Colintrave Point ( $55^{\circ} 55' N.$ ,  $5^{\circ} 09' W.$ ), on the northeastern shore  $3\frac{1}{4}$  miles within the entrance, where there is a pier, and about  $\frac{3}{4}$  mile farther northeastward it is almost blocked by Burnt Isles, between which are two narrow channels.

There is a depth of 10 feet (3 m.) at low water alongside the pier.

**Measured distance.**—A distance of 3,042 feet has been measured between beacons on Ardmaleish Point and another pair southward of them. The northern pair are 178 feet apart and the southern pair 154 feet apart. The running line is Ardbeg Point, bearing  $164^{\circ}$  true, ahead.

**Light buoy.**—A red conical buoy, showing an occulting white light, is located about 250 yards northeastward of Ardmaleish Point on the edge of the bank.

**Burnt Isles** are a group of islets and rocks, the highest of which is 17 feet (5.2 m.) high, standing on a bank that extends across the East Kyle.

**The southern channel,** between the isles and the coast of Bute, is very tortuous, and has a navigable width of less than 100 yards, with depths of from 11 to 26 feet (3.4 to 7.9 m.). As the tidal currents attain a rate of 3 knots at springs, it is necessary, even under steam, to use extreme caution when entering, cases having occurred of steam vessels being caught on the bow by the current and stranded before they could answer the helm.

**Rocks—Buoys.**—Woodfarm Rock, with 7 feet (2.1 m.) least water, lies on the southern side of the eastern entrance to the southern channel, and a red conical buoy, No. 43, is moored on its northern end.

Shoal water extends 150 yards northeastward of Bear Craig.

Beere Rock, with 9 feet (2.7 m.) of water, lies 150 yards northward of Bear Craig, and a red conical buoy, No. 44, is moored eastward of it.

A rock with 8 feet (2.4 m.) water lies 200 yards westward of Beere Rock, and near the extremity of shoal water extending off the shore of the bay westward of Bear Craig.

A patch with 4 feet (1.2 m.) of water lies on the northern side of the channel 150 yards eastward of Beere Rock.

Creyke Rock, with 9 feet (2.7 m.) water, lies at the northwestern entrance, 350 yards eastward of Buttock Point, and a black can buoy, No. 45, is moored on its western side.

Buttock Point, in range with Bear Craig, the point next south-eastward of it  $289^{\circ}$ , leads northeastward of Woodfarm Rock.

**The northern channel** lies between Eilean Buidhe ( $55^{\circ} 56' N.$ ,  $5^{\circ} 10' W.$ ), which is connected to the main by rocky ledges on the northeast, and the southern group of the isles, with the shoals extending from them, on the southwest. It is only 50 yards wide between the 12-foot (3.7 m.) curve, with depths of from 18 to 23 feet (5.5 to 7 m.). The channel, however, is straight, a  $302^{\circ}$  course leading through in a least depth of 18 feet (5.5 m.) at low water, and it is the better of the two channels for navigation, either by day or by night.

**Beacons.**—Two red concrete beacons, with conical tops, mark the northeastern edge of the shoals on the southwestern side of the channel. The eastern beacon stands about 90 yards northward of the northeastern point of Eilean More, the western beacon about 200 yards northwestward from the same point.

**Light.**—An occulting white, 21 feet (6.4 m.) above water, visible 5 miles, is shown from a black concrete beacon, surmounted by a tank, on the shoal extending from Eilean Buidhe on the northeastern side of the channel.

**Buoy.**—A black can buoy is moored about 20 yards southward of the light beacon, on the southwestern edge of the shallow water.

**Anchorage.**—There is good anchorage in 6 to 7 fathoms (11 to 12.8 m.) 300 yards eastward of the southern end of Eilean More.

**Buoy.**—A black can buoy, No. 42, is moored on the edge of the bank extending offshore about 300 yards eastward of Eilean Buidhe.

**Tides and tidal currents.**—It is high water, full and change, at the Burnt Isles, at 11h. 50m.; springs rise 10 feet, neaps 8 feet; neaps range 6 feet.

The current from Inchmarnock Sound runs northward through the West Kyle at a rate of  $1\frac{1}{2}$  knots at springs until near Rudha Dubh, where the rate increases to  $2\frac{1}{2}$  knots at springs. After filling

Loch Riddon the current turns round Buttock Point and runs south-eastward through the Burnt Isles Channels into the East Kyle at a rate of 3 knots at springs, and runs down that Kyle until it meets the current flowing in at its southern end.

The current entering the West Kyle is the one that predominates.

The outgoing current runs through the Burnt Isles Channels, also at a rate of 3 knots at springs, round Buttock Point, through the West Kyle and Inchmarnoch Sound.

**Loch Striven** extends northward 7 miles from Strone Point, the southern point of the peninsula, separating the loch from the East Kyle, and it has a width of about 1,600 yards for  $3\frac{1}{2}$  miles, whence it gradually narrows to 400 yards at its head. The water is too deep for anchorage, and the place is but little visited on account of the violent squalls which descend from the steep mountains bordering the shores.

This loch is known as the weather glass of Rothesay, the gathering of clouds and mists on the shores being a sign of bad weather.

**Tides.**—It is high water, full and change, in Loch Striven at 11h. 55m.; springs rise 6 feet. The tidal currents in the loch are weak.

**Holy Loch** extends northwestward 2 miles, with a width of about half a mile, from between Hunters Quay and Strone Point, on the western side of the Firth of Clyde. The loch has general depths of from 16 to 12 fathoms (29.3 to 21.9 m.) to about 800 yards from its head, within which distance it dries at low water; the bottom is mud and good holding ground. Vessels frequently anchor, where most convenient, in the loch in southerly to southwesterly gales, but with strong northwesterly gales the squalls are very violent, and vessels have been driven into the firth. The tidal currents in the loch are weak.

There is a pier, used by steam vessels, in Ardnadam Bay, on the southern shore, about  $1\frac{1}{4}$  miles within the entrance to the loch.

**Measured distance.**—A measured distance of 3,040 feet with a depth of 15 to 22 fathoms (27.4 to 40.2 m.) on the running line, has been established on the southern side of Holy Loch.

**Strone Point** ( $55^{\circ} 59' N.$ ,  $4^{\circ} 54' W.$ ) is the rounded northern entrance point to Holy Loch, and the western entrance point to Loch Long. A spit, dry at low water, extends 250 yards southward of the point, and there are depths of less than 5 fathoms (9.1 m.) for 250 yards farther southward.

**Light buoy.**—A black can buoy, No. 30, showing an occulting white light, is moored 300 yards southward of Strone Point.

**Loch Long.**—The entrance to Loch Long, between Strone Point on the west and Barons Point on the east, is  $1\frac{1}{2}$  miles wide, and the loch extends northward 4 miles, with a width of about 1 mile, and

then northeastward 3 miles, with a general width of half a mile, to Meall Daraich, where Loch Goil branches off to the northward.

The upper part of the loch from Meall Daraich ( $56^{\circ} 06' N.$ ,  $4^{\circ} 51' W.$ ), extends northeastward 8 miles, with an average width of a little less than half a mile, to its head at Arrochar, where it is separated from Loch Lomond by an isthmus  $1\frac{1}{4}$  miles wide.

**Navigation.**—The navigation of the loch is difficult for sailing vessels on account of the squalls, sudden calms, and variable winds.

**Depths.**—The depths in mid-channel of the loch are from 50 to 25 fathoms (91.4 to 45.7 m.) until within 2 miles of its head, when they decrease gradually to 8 fathoms (14.6 m.), which latter depth is close up to the edge of the bank at the mouth of Loin Water.

**Anchorage.**—For a distance of 5 miles from the entrance, anchorage may be had at a moderate distance offshore on either side, but beyond this distance, and below Meall Daraich, the shores have deep water close-to and rise to mountains of considerable height.

There is fair anchorage in Finart Bay, on the western side of the loch about  $4\frac{1}{4}$  miles from the entrance, at a moderate distance from the shore, but with northwesterly winds squalls form in Glen Finart and rush through with great violence during gales.

The upper part of Loch Long, except for  $1\frac{1}{2}$  miles on the southeastern side within its entrance at Meall Daraich, where the hills are comparatively low, is inclosed by high and precipitous hills with many rocky crags, several of the hills rising to mountains over 2,000 feet (609.6 m.) in height. The Cobbler, a conspicuous crag of Ben Arthur, about  $1\frac{3}{4}$  miles northwestward of the head of the loch, is 2,885 feet (879.3 m.) high. The lower slopes of the hills are wooded in many places, but there is little cultivated or inclosed land.

Loin Water flows into the head of the loch and Croe Water into its western side at Ardgartan,  $1\frac{1}{2}$  miles from the head. Both are considerable streams.

The shores are nearly everywhere steep-to, with the exception of a bank at the mouth of Croe Water and a bank at the mouth of Loin Water, both of which banks uncover at low water.

**Meall Daraich** is bold and precipitous. **Carraig nan Ron** (Dog Rock) ( $56^{\circ} 06' N.$ ,  $4^{\circ} 52' W.$ ), a small rocky islet 11 feet (3.4 m.) high, lies close off it, and is connected to it at low water.

**Portincaple**, a little hamlet, is on the southeastern shore directly opposite Meall Daraich. **Ardarroch** is a large and conspicuous house, amid wooded grounds, situated close to the shore a mile farther up the loch.

Glenmullan Burn flows into the loch 1 mile above Ardarroch, and at its mouth the shore dries out for 100 yards. The width of the loch at Ardarroch is contracted to 600 yards by Cnap Point, which projects slightly from the northwestern shore.

**Ardgartan Point.**—The shores of the loch are steep-to on both sides from Cnap Point to Ardgartan Point, a distance of 4 miles. Ardgartan Point, formed by the delta of Croe Water, is low and projects into the loch on its western side; Ardgartan House stands on it amid trees, and the extremity of the point is an open grassy field.

**Ardgartan Bank,** of sand, stones, and gravel, with great quantities of mussels, uncovers at low water for 250 yards from the southern side of Ardgartan Point and narrows the loch between it and Ardmay Point, on the southeastern shore, to less than 400 yards.

**Beacon.**—The edge of the bank, which is steep-to, is marked by a black wooden pole 20 feet (6.1 m.) high, surmounted by a cylinder.

**Torpedo range.**—A torpedo range has been established in Loch Long in an area lying between lines starting at the discharging station, which is situated about midway between Ardgartan Point and the head of the loch, and passing 100 yards northwestward and 100 yards southeastward from a line of targets which extends about 7,000 yards southwestward from the discharging station.

The limit of the area is 200 yards northwestward and 200 yards southeastward of the center line at its southwestern end.

The limits of the area will be marked by white obelisks erected at or near high-water mark at each end of the range and on both sides of the loch.

The range will be in use several hours daily for running uncharged torpedoes, except on Sundays and generally after noon on Saturday; but the area will not be closed to the public after noon on Saturdays from the 15th of June to the 15th of September, inclusive.

There will be intervals between consecutive runs.

When the range is in use flags will be hoisted at the discharging station, at the southwesternmost target in use at the time, and at the intervening targets.

Red flags hoisted halfway up indicate that preparations are being made for running a torpedo, and that any vessel within the range must move out of it with all reasonable speed.

The red flags are hoisted close up immediately before the torpedo is discharged and are kept up until the torpedo has completed its run, which occupies from two to six minutes.

White flags indicate that torpedo running is temporarily suspended.

Vessels or boats having occasion in the course of their passage to cross the line of range or to enter any portion of the range area may do so while white flags are displayed, but they must cross or pass through the area with all reasonable speed and keep well clear of the targets.



Floating targets, on which lights will be exhibited during such hours and in such a manner as may be prescribed by the board of trade, will be moored on the line of range at intervals of about 1,000 yards from the discharging station.

**Arrochar** ( $56^{\circ} 12' N.$ ,  $4^{\circ} 45' W.$ ), a good-sized village, stands on the southeastern shore at the head of the loch. The Arrochar Hotel is the most conspicuous building, and in front of it and belonging to it is a wooden pier, 160 feet long with a T head, alongside which there is a depth of 9 feet (2.7 m.) at low water. Steamers call regularly at the pier during the summer.

Fresh provisions and groceries in small quantities can be procured in the village, and in large quantities by rail from Glasgow.

**Anchorage.**—Small vessels can obtain temporary anchorage off Portincaple, close southward of Cnap Point, and close southward of Ardgartan Point. There is good anchorage anywhere within  $\frac{1}{2}$  mile from the head of the loch in from 12 to 8 fathoms (21.9 to 14.6 m.), mud bottom, and good holding ground.

**Boat sailing.**—Owing to the surrounding high hills and deep valleys, the loch is subject to sudden squalls, and boat sailing is dangerous.

**Tides.**—It is high water, full and change, at Arrochar at 11h. 53m.; springs rise 12 feet, neaps 9 feet; extraordinary springs rise  $13\frac{1}{2}$  feet; neaps range 6 feet.

A strong wind blowing up the loch will raise the mean level of the water from 1 to 2 feet (0.3 to 0.6 m.).

The tidal currents are weak.

**Communications.**—The West Highland Railroad passes along the southeastern side of the upper part of Loch Long, and there are stations at Whistlefield, near Portincaple, and at Arrochar and Tarbet. The high road from Inveraray to Dumbarton encircles the head of the loch and passes along the southeastern shore of its upper part.

**Loch Goil** branches off Loch Long on the southern side of Meall Daraich and extends northward 5 miles with a general width of  $\frac{1}{2}$  mile, but of about 400 yards in the channel  $\frac{3}{4}$  mile within the entrance.

The navigation is difficult for sailing vessels for the same reasons as it is in Loch Long.

The best anchorages are off Carrick Castle (ruin), where the water shoals suddenly to about 7 fathoms (12.8 m.), and at the head of the loch.

About  $\frac{1}{2}$  mile above Carrick Castle is a detached rock ( $56^{\circ} 07' N.$ ,  $4^{\circ} 54' W.$ ), marked by a perch, 300 yards off the western shore.

A rock with a depth of about 6 feet (1.8 m.) lies about 100 yards northeastward of Douglas Pier, about 1 mile from the head of Loch Goil. A black can buoy marked "Douglas," is moored on the southern side of the rock.

**Tides.**—It is high water, full and change at the head of Loch Goil at 0h. 6m.; springs rise 10 feet, neaps 8 feet.

**Gare Loch approach.**—On the northeastern side of the Clyde Estuary, opposite Greenock, the land falls back and forms a deep bay between Rosneath Point and Ardmore Head, which is  $2\frac{1}{2}$  miles to the southeastward. In the northern corner of this bay is the entrance to Gare Loch.

**Western approach.**—**Rosneath Point** is wooded and low, indented by Culwatty Bay, at the head of which is a small cottage, visible from the sea.

**Dangers.**—The 10-fathom (18.3 m.) curve passes around Rosneath Point at only 700 yards. There is, however, a rocky patch of 25 feet (7.6 m.) surrounded by 40 and 50 feet (12.2 and 15.2 m.) just inside. From this patch the center of Green Island bears  $342^\circ$ , distant 780 yards. Another patch of 29 feet (8.8 m.), surrounded by considerably deeper water, is situated with Green Island bearing  $2^\circ$ , distant 760 yards. The tides set strongly across these patches, and caution is necessary rounding Rosneath Point.

**Perch Rock** is a small flat-topped rock, covered with seaweed, and dries 6 feet (1.8 m.). From it Green Island bears  $269^\circ$ , distant 240 yards. About 50 yards eastward of Perch Rock is a small head, which dries 2 feet, and is also covered with seaweed. A black can buoy in 21 feet marks the position of these shoals.

**Green Island** is a small grass-covered islet, difficult to distinguish. Rosneath Farm, a castellated building with a tower, is somewhat conspicuous, but from certain directions obscured by trees. Off the southeast of Rosneath Point the house is seen through a clearing in the trees, but not again when rounding till off Castle Point. The house is high, with a flat tower, but not very conspicuous. From Castle Point the land recedes to Rosneath Bay, wooded to the water's edge, with sloping fields behind. The coast is fronted by mud flats to Limekiln Point.

In **Rosneath Bay** there is a narrow rocky projection from Castle Point, with depths of 28 to 30 feet (8.5 to 9.1 m.) at a distance of 650 yards and a rock with 14 feet (4.3 m.) at 350 yards. To avoid these, care must be taken in regard to the set of the tide.

**Pier.**—A little to the southward of Limekiln Point is a small wooden pier, with 9 to 10 feet (2.7 to 3.1 m.) alongside at low water. There are landing steps for boats on the inner side of the pier. The road from Rosneath runs from the end of the pier past the Princess Louise Convalescent Home.

**Telegraph beacon.**—A tall wooden beacon, painted in red and white bands, with a diamond-shaped top mark, shows the landing place of the cable.

**Perch.**—A black wooden perch, with square lattice top mark, marks the end of Limekiln Point. It shows about 6 feet (1.8 m.) at high water. Beyond Limekiln Point the land falls back to Stroul Bay, forming the southwestern end of Gare Loch. The shore is edged by a 10-foot (3 m.) earth cliff, crested by trees for about  $\frac{1}{2}$  mile; then it turns to the northwestward and is low. The town of Clynder faces the loch at this point, and is fronted by a low sea wall. On the Gare Loch side of Limekiln Point is a boat builder's establishment with two slips nearly to low-water line. The 1-fathom (1.8 m.) curve at this point of the bay extends 300 yards from high-water mark. Off Clynder is a bank of rock and stones which dries 200 yards from the shore, and below Carraig-nan-Roin, the outer end being marked by a black perch and white top mark.

**Eastern approach.**—**Ardmore Head** ( $55^{\circ} 58' \text{ N.}, 4^{\circ} 42' \text{ W.}$ ) is a peninsula on the southern point, projecting about  $\frac{3}{4}$  mile and facing Rosneath Point. It is low and rocky, but covered with grass. There is, however, a sudden rise of about 80 feet (24.4 m.), forming the Hill of Ardmore, crested with trees, in the central part of the peninsula. To the southward it is less steep, and Ardmore House can be seen among the trees from the Clyde. On the highest part of the plateau is a circular building, about 30 feet (9.1 m.) high, with a flagstaff on a turret, separate from the house. Neither are usually visible from the approach to Gare Loch. To the northward of Ardmore Head the coast is low and fronted by extensive hard mud flats, which dry 800 yards from the shore. There are some large stones on the flats, dangerous to boats at certain stages of the tides. The road and railroad to Glasgow run along the low country parallel to the shore. At the back the ground slopes upward to a highest point of 972 feet (296.3 m.) on Killoeter Ridge.

**Craigendoran Pier.**—About  $1\frac{1}{2}$  miles north of Ardmore Head is a large pier, 700 feet long, with a railway station at the base, alongside which North British Railroad steamers are moored in connection with their railroad.

**Caution.**—A considerable number of steamers cross at this point, especially in the summer, and particular care should be used at the entrance of Gare Loch.

**Lights.**—A fixed green light is exhibited at the end of the southern pier and a fixed red light on the northern pier.

**Fog signal.**—A fog signal is sounded from the northern pier when steamers are expected.

**Anchorage.**—There is a good anchorage for small vessels, from 14 to 18 feet (4.3 to 5.5 m.), mud over clay, between Ardmore and

**Craigendoran.** The tide does not run strongly, but a short choppy sea gets up with a southwest wind, to which direction it is exposed. It is a test ground for newly built dredgers and consequently is somewhat uneven.

**Coast.**—From Craigendoran Pier the shore is low and fronted by sea walling, about 6 feet (1.8 m.) high. This forms the sea front of Helensburgh and extends beyond Cairndhu Point.

**Helensburgh—Pier.**—This projects 800 feet from the shore off the town. It is built of stone at the base with a wooden pierhead, on which is situated a fairly conspicuous red-roofed office, where there is about 9 feet (2.7 m.) of water, and steamers call alongside.

There are landing steps on the stone portion of the pier. The inner steps dry, but there is  $1\frac{1}{2}$  feet (0.5 m.) at low water at the outer steps.

**Shoals.**—Two small 6-foot (1.8 m.) patches of sand lie about 70 yards from the pierhead.

**Lights.**—A fixed red light is exhibited from the outer end of the pier and a fixed green light from the inner end. Neither are clearly distinguishable, as they are overpowered by the numerous gas lamps along the pier and sea front.

**Caution.**—A flat of sand and stones extends 250 yards from the sea wall off Helensburgh. Drainpipes also run over this foreshore. It is therefore necessary for boats to be careful at certain stages of the tide when proceeding over this area.

**Appearance from seaward.**—There is a grassy space about 100 feet between the sea wall and the front of the town. At the foot of the pier is a stone obelisk, about 30 feet (9.1 m.) high, with a tall flagstaff near it and a large band stand painted green. The church is a plain building with a square clock tower and pointed roof. There are other churches, but usually inconspicuous.

**Anchorage.**—Small craft can anchor anywhere off Helensburgh, the best anchorage being to the southward of the pier in sand and mud, with not much tidal current. Caution should be taken by small craft not to anchor too near the steamer route between Craigendoran and Row, as their wash is considerable.

**Repairs, supplies, etc.**—Helensburgh, being a summer resort only, through frequently visited by yachts, has no facilities for repairs, coal, or water, though arrangements can be made from Greenock by lighters. Ordinary supplies can be obtained.

**Hospitals.**—There are two hospitals, the "General" and the "Infectious diseases," the former with 20, and the latter 36, beds.

**Cairndhu Point** ( $56^{\circ} 01' N.$ ,  $4^{\circ} 46' W.$ ), at the northern end of Helensburgh, has a gradual slope and is grassy, with trees at the back. From Cairndhu Point the coast trends westward and is

fronted by a sea wall throughout, with the road close at the back. The land behind is wooded and slopes fairly steeply from the sea to the high moorland. At the northern end of the bays is the small village of Row (pronounced "Roo"), with a pinnacled church among the trees, conspicuous from all parts of Gare Loch approach.

**Pier.**—Midway between Cairndhu and Row Points is a stone pier with a wooden pierhead, where steamers can go alongside in 9 feet (2.7 m.) at low water. There are stone steps just inside the pierhead.

**Row Point** projects 450 yards from the sea wall, and is awash for half its length at high water.

**Telegraph beacon.**—This is a tall wooden beacon, painted red and white stripes with a diamond top mark similar to that on Limekiln Point opposite. From Row Point the coast trends northward, forming the eastern side of Gare Loch.

**Light.**—An occulting white light, 16 feet (4.9 m.) above water, visible 5 miles, is shown from a red beacon, surmounted by a red tank, 23 feet (7 m.) high, on the eastern side of the Narrows, on the southwestern point of the reef off Row Point.

**Anchorage.**—There is good anchorage for small craft south of Row Point, the best being on the Row side, where the tides are less felt. Off Rosneath the bottom is irregular and rocky in places, but it affords more shelter from a southerly wind. The anchorage in Row Bay is, however, somewhat limited, owing to yachts, for which 12 mooring buoys are laid down. Also the training ship *Empress* is moored by the bow in the center of the bay, and swinging to the tide takes up considerable space. Row Anchorage is more sheltered and convenient than Helensburgh, but in a southerly gale it is unsafe and landing impossible. Then, if possible, it is advisable to cross to Rosneath.

**Buoys.**—After passing into Gare Loch the northern edges of the shoals are marked by a black can buoy in 13 feet (4 m.) on the western side, and by a red conical on the eastern side in 17 feet (5.2 m.).

**Gare Loch.**—From the entrance between Limekiln and Row Points, which has a breadth of about 100 yards between the 3-fathom (5.5 m.) curves, the lock extends northward  $4\frac{1}{4}$  miles, with an average width of 1,400 yards, and depths of from 25 fathoms (45.7 m.) within the entrance to 10 fathoms (18.3 m.) near the head.

**Directions into Gare Loch.**—Rosneath Point should be rounded at a distance of 1,000 yards. When Row Church bears  $328^\circ$ , steer for it until Castle Point bears  $278^\circ$ ; then alter course to  $297^\circ$  for Limekiln Point. When Row Church bears  $39^\circ$ , steer to pass through the Narrows between the black and red buoys. Caution is neces-

sary with an ebb tide, as a vessel might be set toward the shoal water on Limekiln Point side.

**Anchorage.**—There is no good holding ground in the loch, the bottom consisting of mud and loose stones. During the summer months vessels may anchor off Row Point in 13 fathoms (23.8 m.), but in the winter months vessels are liable to drag their anchors in the strong northerly winds experienced at times.

**Tides and tidal currents.**—It is high water, full and change, in Gare Loch at 0h. 2m.; springs rise 10 feet. At springs the current in the Narrows turns about 10 minutes later than the time of high and low water at Row Pier. There is slack water for about half an hour between the end of ebb and beginning of flood, but practically none at the other turn of the tide. Ebb tides reach a maximum speed of  $2\frac{1}{4}$  knots at springs, with an eddy off Rosneath Pier toward Limekiln Point. The flood tide attains a speed of  $1\frac{1}{2}$  knots in the Narrows. The currents at the entrance to the inner portion of this loch probably acquires a speed at times of 4 to 5 knots. The entrance lies between Limekiln and Row Points, and is about 300 feet wide.

The tidal currents set north and south through the approach and along the deeper channel on the western side, averaging 1 knot. On the eastern side, which is shoaler, the current is of less strength, probably accounted for by tidal factors off Ardmore Head.

The current is often running in on the eastern and out on the western side. This is chiefly noticeable in the basin formed by Row, Castle, and Cairndhu Points.

Off Ardmore Head the spring tides have an average speed of  $\frac{3}{4}$  knot. The current sets first to the westward, then northwest, and finally northward on the falling tide. When the tide is rising it sets to the eastward, southeastward, and southward.

Off Helensburgh the spring tides have an average speed of 0.4 knot, and the neap tides are much the same. From the middle of the falling tide to the middle of the rising tide the currents set first to the northwestward, then through north to the northeastward. During the rest of the tide it flows to the south and southwestward. The neap tides follow much the same direction.

Off Row the tides have a maximum speed of  $\frac{3}{4}$  knot at springs and  $\frac{1}{2}$  knot at neaps. The current sets to the southeastward from high water till 2 hours after. For the rest of the time it sets constantly to the northwestward. The direction and speed of the tide is practically the same at springs and neaps.

It is high water in Gare Loch one hour earlier than at Dover.

**Measured mile.**—About halfway up the loch, on the western shore, two pairs of beacons mark a measured mile of 6,080 feet for

testing the speed of steamships—a purpose for which this loch is admirably suited, both for the smoothness of the water and the absence of tidal currents. The running course for the mile is  $336^{\circ}$  and  $156^{\circ}$ , each pair of beacons in range bearing  $246^{\circ}$ , and the depths on the mile vary from 15 to 22 fathoms (27.4 to 40.2 m.).

There are also half-mile and quarter-mile beacons, all consisting of white poles.

**Floating dock.**—A floating dock is moored about 1,600 yards from the head of the loch. (See Appendix II.)

**Pier.**—There is a small wooden pier with a T head, in front of the Garelochhead Hotel, which stands at the south end of the village. There is a depth of 5 feet (1.5 m.) alongside the T head of the pier at low water.

There is also a pier at Barremman just north of Clynder, and another pier on the western shore about 1 mile from the head of the loch.

**Supplies** can be obtained from Garelochhead, the large village situated at the head of the loch.

**Communications.**—Railroad steamers run daily between Garelochhead, Helensburgh, and Greenock throughout the year.

The West Highland Railroad runs up the east side of the loch, with three stopping places—Row, Shandon, and Garelochhead.

**Loch Lomond** is an inland lake trending northward 18 miles from about 4 miles northward of Dumbarton, with a width varying from 4 miles to 300 yards, and it has a greatest depth of 101 fathoms (184.7 m.). The loch receives several streams, and is studded with numerous wooded islands. It is surrounded by mountains, Ben Lomond, on its eastern side, attaining a height of 3,192 feet (972.9 m.).

### CHAPTER III

#### THE MULL OF CANTYRE TO LOCH FEOCHAN—THE ISLANDS OF ISLAY, JURA, SCARBA, COLONSAY, Luing, SEIL—ISLES OF THE SEA, ETC.

The west coast of the peninsula of Cantyre from the Mull of Cantyre, trends northeastward about 20 miles to the entrance to Gigha Sound, which is the channel between Gigha Island and the peninsula. The coast is bleak and rugged, with sandy beaches in the bays, and northward to Glenacardock Point is open to the Atlantic swell, which rolls home and breaks heavily even during calm weather.

**Tides.**—It is high water, full and change, at the Mull of Cantyre at 10 h. 35 m.; springs rise 4 feet.

**White Point** ( $55^{\circ} 22' N.$ ,  $5^{\circ} 48' W.$ )  $3\frac{1}{2}$  miles northward of the Mull, is prominent, and Strangarve,  $1\frac{3}{4}$  miles north-northeastward of White Point, is also noticeable. Skerrinagal Rock, small, with less than 6 feet (1.8 m.) water, lies about 400 yards westward of Strangarve. Ilanaham Point, the western point of Machrihanish Bay, is  $2\frac{1}{2}$  miles north-northeastward of Strangarve.

**Shewinagal Rock**, small, with less than 6 feet (1.8 m.) of water, lies about 400 yards westward of Strangarve.

**Skerrivore**, a patch 200 yards in extent, lies 600 yards northward of Ilanaham Point, and there is a depth of about 4 fathoms (7.3 m.) in the channel between. The rock is almost invariably marked by breakers, and a great rise of the swell generally exists northward of it, which makes the rock appear of greater extent than it really is. White Point open of Strangarve leads about 1 mile westward of the rock. At night, Mull of Cantyre Light in sight leads at least  $1\frac{1}{2}$  miles westward of it.

**Machrihanish Bay** is formed by the coast from Ilanaham Point falling back for about 1 mile to the eastward with a southerly curve and then turning to the northward. The depth in the bay is less than 5 fathoms (9.1 m.), and two small rocks, with 2 to 3 feet (0.6 to 0.9 m.) water, lie about 200 yards offshore. They bay, though affording some shelter from southerly and southwesterly winds, has an unenviable reputation and is not used as an anchorage.

**Lifeboat.**—A lifeboat is stationed at Machrihanish.

**Malcolm Rock.**—The coast from Machrihanish Bay to Glenacardock Point, a distance of 9 miles, is nearly straight and almost free from off-lying shoals: but Malcolm Rock, awash at low water, lies



about  $\frac{1}{4}$  mile offshore nearly 3 miles southward of Glenacardock Point. The northeastern end of Gigha Island, well open westward of Glenacardock Point,  $2^\circ$ , leads westward of the rock.

Barr Burn, a patch with  $4\frac{3}{4}$  fathoms (8.7 m.) of water lies  $1\frac{1}{2}$  miles southwestward of Glenacardock Point and  $\frac{1}{2}$  mile offshore.

**Tidal currents.**—The main tidal currents westward of the Mull of Cantyre run in a south-southeast or north-northwest direction, but a part of the north-going current is diverted northward toward the Sounds of Islay and Jura, leaving an area along the west coast of Cantyre between Skerrivore and Eilean More of the MacCormaig Isles, where comparatively weak currents, or eddies from the main currents, prevail.

The current runs to the northward from the Mull of Cantyre close along the shore from 1 hour before to 5 hours after high water at a rate of  $2\frac{1}{2}$  knots at springs, and to the southward from 5 hours after high water to 1 hour before high water at a similar rate. The currents cause races and overfalls off White Point, Skerrinagal, and Skerrivore, where they attain a rate of 4 knots.

Northward of Skerrivore there is an eddy which runs southward for 9 hours, close inshore from near Eilan (lat.  $55^\circ 30'$  N.) from about high water until 3 hours before the next high water; but outside a line between Skerrivore and Eilan the currents run 6 hours each way, the north-going current beginning about 1 hour before low water and the south-going current about 1 hour before high water.

**Gigha Sound.**—The southern entrance to Gigha Sound lies between Glenacardock Point and the Mull of Cara, about 3 miles to the northward. The eastern shore of the sound is everywhere low, but rises to hills of moderate height a short distance inland. Runaheoran Point,  $6\frac{1}{4}$  miles northeastward of Glenacardock Point, is the end of a long projecting flat only a few feet high, and abreast of it the sound is less than  $1\frac{1}{2}$  miles wide. A shallow bank extends off the whole of the eastern side of the sound, and there is a depth of from 2 to 6 feet (0.6 to 1.8 m.) for a distance of nearly 1,000 yards around Runaheoran Point.

**Cara Island** ( $55^\circ 37'$  N.,  $5^\circ 45'$  W.) is about 1,700 yards long north and south and  $\frac{1}{4}$  mile wide. The Mull of Cara, its southern point, is 172 feet (52.4 m.) high.

**Gigha Island.**—Gigha (pronounced hard and short, as if spelled Ghia) Island, about  $5\frac{1}{4}$  miles in length north and south, with a greatest width of  $1\frac{1}{2}$  miles, lies  $\frac{1}{2}$  mile northward of Cara Island, the space between being studded with rocks, through which is Gigulum Sound, a narrow passage with depths of  $2\frac{1}{4}$  to 4 fathoms (4.1 to 7.3 m.), available as a channel for small vessels with local

knowledge, and to such affording good and safe anchorage with all winds.

Gigulum Island, about 1,000 yards long, lies nearly  $\frac{1}{2}$  mile north of Cara Island and is separated from Gigha Island by a narrow, intricate channel, with depths of  $2\frac{1}{2}$  to 4 fathoms (4.6 to 7.3 m.).

Craigban Beacon, a hill about  $2\frac{1}{4}$  miles from the northern end, rising to a height of 328 feet (100 m.), is the highest land in Gigha.

The islands of Gigha and Cara contained 264 inhabitants in 1921.

There is a post and telegraph office at Ardminish and also a pier. and steamers from West Loch Tarbert call regularly.

Ardminish Bay and Drum-yoin Bay, on the eastern side of Gigha Island, are good anchorages, well sheltered from westerly winds, but only a knowledge of the locality would justify a mariner in seeking shelter in these anchorages on account of the numerous shoals in their approaches.

There are so many shoals in Gigha Sound that its navigation should never be attempted without local knowledge. Strangers should always pass westward of the island.

**Rocks and shoals—Sgeir an Tru.**—About  $\frac{3}{4}$  mile north-northeastward of Glenacardock Point, a  $2\frac{1}{4}$ -fathom (4.1 m.) bank commences, which runs parallel with the coast of Cantyre, and about 1,400 yards distant from it. This bank is about 1 mile in length, and  $\frac{1}{4}$  mile northward of its northern end is Sgeir an Tru, a small patch which dries 3 feet (0.9 m.). There is a channel between it and the shore which requires local knowledge. The buildings in Gigha, known as Achamore, open westward of Gigulum Hill, bearing  $335^\circ$ , leads westward, and Cairnleam Peak, in range with the northeastern extremity of Cara Island,  $315^\circ$ , leads eastward.

Beachmore Point, on which stands Cleite Church, is situated  $2\frac{1}{4}$  miles northeastward of Glenacardock Point, and from 400 yards off Beachmore Point the 3-fathom (5.5 m.) curve takes a northerly direction for 4 miles to nearly  $\frac{1}{2}$  mile off Runaheoran Point, the shallow bank southward of that point extending nearly a mile from the shore of the bay formed by it. Northward of Runaheoran Point, the 3-fathom (5.5 m.) edge of the bank turns northeastward and terminates  $1\frac{1}{2}$  miles from that point and 1 mile from the shore. Many shoal rocky patches lie within the edge of this bank; and near its northern end, 600 yards within its edge, is Cainsdaig Rock, 7 feet (2.1 m.) high.

**Cara Flat** extends 100 yards eastward from Cara Island. It has general depths of from 3 to 4 fathoms (5.5 to 7.3 m.), the outer rocky patch of 3 fathoms (5.5 m.) being 800 yards east-southeastward from the northeastern point of the island.

**Cara Rock** ( $55^{\circ} 38' \text{ N.}$ ,  $5^{\circ} 44' \text{ W.}$ ), with  $2\frac{1}{4}$  fathoms (4.1 m.) water, lies 1,400 yards east-northeastward of the Mull of Cara at the southwestern end of a narrow ridge 800 yards long, near the northeastern end of which is a  $3\frac{1}{4}$ -fathom (5.9 m.) patch. Craigban Peak in range with the northern rock off Gigulum Island,  $355^{\circ}$ , leads between Cara Rock and Cara Flat; Cairnleam Peak open west-southwestward of Cara ruin,  $323^{\circ}$ , leads south-southwestward of Cara Rock.

**Rhu Mhurachy Rocks** are several shoal patches, with from  $1\frac{1}{2}$  to  $2\frac{1}{4}$  fathoms (2.7 to 1.1 m.) water, on a narrow ridge 1,200 yards in length  $14^{\circ}$  and  $194^{\circ}$  within the 5-fathom (9.1 m.) curve, the southern end of which is 1,800 yards east-northeastward of the northeastern point of Cara Island.

At  $\frac{1}{4}$  mile eastward of the northern end of the ridge is a shoal with  $3\frac{1}{2}$  fathoms (6.4 m.) water.

**Gigulum Rocks**, a narrow ridge, nearly  $\frac{1}{2}$  mile in length, northward and southward, within the 5-fathom (9.1 m.) curve, the highest part of which covers at high water, lies about 700 yards west-northwestward of Rhu Mhurachy Rocks.

**Buoy**.—A spherical buoy, painted with red and white horizontal bands and surmounted by a staff and triangle, is moored in 6 fathoms (11.0 m.) water at the northern end of Gigulum Rocks.

**Wee Rocks** are two small patches, about 200 yards apart, with 4 and 6 feet (1.2 and 1.8 m.) water, respectively, lying about 700 yards north-northeastward of Rhu Mhurachy Rocks.

Leam Farm, in range with the northeastern end of Oulsin Islet,  $282^{\circ}$ , leads between Wee and Rhu Mhurachy Rocks and directly toward the middle of the Gigulum Rocks.

**Flat Rock** is a small rocky patch with  $1\frac{3}{4}$  fathoms (3.2 m.) water, lying 600 yards north-northeastward from the northern Wee Rock; a patch with  $2\frac{1}{4}$  fathoms (4.1 m.) lies 200 yards northward of Flat Rock.

Cairnleam Peak, in range with the northern end of Oulsin Islet,  $250^{\circ}$ , leads between Sgeir Chaolais and Flat Rock, and northward of the shoal extending from Gigulum Rocks.

**Sgeir Chaolais**, a small rock which dries 1 foot (0.3 m.), lies 1,300 yards eastward of Liath Eilean, and has depths of 3 to 4 fathoms (5.5 to 7.3 m.) around. Black Rock,  $290^{\circ}$ , leads northeastward of the rock.

**Drum-yoin Reef**, a rocky ledge that dries in places extends 1,100 yards northward from Ardminish Point, on the eastern side of Gigha Island.

**Bhlar Rock**,  $15^{\circ}$ , distant 1,600 yards from Ardminish Point, is 8 feet (2.4 m.) high; a rocky reef lies 200 yards southward of it.

There is a depth of 5 fathoms (9.1 m.) at the distance of 100 yards around the rock and reef.

**Nodha Rock** ( $55^{\circ} 42' N.$ ,  $5^{\circ} 42' W.$ ), 1,400 yards northeastward of Ardminish Point, and at the northern end of a patch 250 yards long northeast and southwest, dries 2 feet (0.6 m.). The main channel is southeastward of it.

**Badh Rock**, of small extent and awash at low water, lies 1,600 yards northeastward of Nodha Rock. This rock is steep-to, and may be passed on either side, the western side being preferable. The channel on the southeastern side is 600 yards wide to depths of  $1\frac{1}{2}$  fathoms (2.7 m.) at the northeastern end of the bank extending offshore northeastward of Runaheoran Point.

**Buoy**.—A spherical buoy, painted with red and white horizontal bands, is moored about 70 yards northeastward of Badh Rock.

Achamore House, just opening southward of Fank Peninsula,  $228^{\circ}$ , leads southward of Nodha and Badh Rocks. The ruin on Cara Island in range with Liath Eilean,  $208^{\circ}$ , leads southeastward of Nodha Rock and northwestward of Badh Rock.

Learga Hill in range with Bhlar Rock,  $274^{\circ}$ , leads north-northwestward of Nodha and southward of Badh Rock; Tarbert Farm just in sight northward of Learga Hill,  $259^{\circ}$ , leads northward of Badh Rock.

**Sturraich Rocks**, two in number of small extent, and 6 feet (1.8 m.) high, occupy a central position in the northern entrance to Gigha Sound at 1,800 yards eastward of Cairnban Point, the northeastern end of Gigha Island; there is deep water around, except that at 200 yards to the northward a small rock dries 1 foot (0.3 m.).

**North Dearg Sgeir**, 10 feet (3.1 m.) high, is the largest of a small cluster of rocks 700 yards off the northern end of Gigha. There is deep water at the distance of 200 yards from the western side of the cluster, but a rock which dries 2 feet (0.6 m.) lies 135 yards northward and a small detached patch with 6 feet (1.8 m.) water 300 yards eastward from the rocks.

The channel between Gigha Island and the Rocks has from 4 to 7 fathoms (7.3 to 12.8 m.) water, and it might be useful to vessels from the northward hauling in for the sound, but it requires local knowledge.

There are other shoals in the sound.

**Telegraph cable**.—A telegraph cable crosses Gigha Sound in an east-southeasterly direction from Ardminish Bay; the landing place on each side is marked by a beacon.

**Tides and tidal currents**.—It is high water, full and change, in Gigha Sound, at 2h. 22m.: springs rise 4 feet, neaps  $2\frac{1}{2}$  feet. The north-going current runs from  $4\frac{3}{4}$  hours before to  $1\frac{1}{4}$  hours after

high water; the south-going current from  $1\frac{1}{4}$  hours after high water until  $4\frac{3}{4}$  hours before the next high water. The currents attain a rate of 3 knots at springs; in Gigulum Sound of  $1\frac{1}{2}$  knots. Outside Gigha Island the north-going current gradually gets later until it merges with the main current running through the Sound of Jura.

**Directions.**—Although it is not advisable for a mariner without local knowledge to take a vessel into Gigha Sound, it may become necessary to do so, when proceed as follows:

From the northward, after passing Sturraich Rocks ( $55^{\circ} 44' N.$ ,  $5^{\circ} 41' W.$ ), which are 6 feet (1.8 m.) high, bring Kilberry Point, between Loch Killisport and West Loch Tarbert, just open westward of Sturraich Rocks,  $4^{\circ}$ , and keep this mark on astern until Leam Farm is in range with Oulsin Islet,  $282^{\circ}$ , then steer  $206^{\circ}$ , which course leads about midway between Cara Rock and Sgeir an Tru. Or keep Kilberry Point just open west-southwestward of Sturraich Rocks, astern, until Cara Ruin is in range with Liath Eilean, which is 12 feet (3.7 m.) high and the highest of the group of rocks lying off Gigha Island 1,400 yards northeastward of Gigulum Island,  $208^{\circ}$ , when keep that mark on until Cairnban Point appears midway between Ardminish Point and Bhlar Rock,  $4^{\circ}$ ; then proceed with this mark on astern, which leads between Gigulum and Rhu Mhurachy Rocks, and east-northeastward of Cara Rocks and Ridge.

From the southward use the same leading marks taken in reversed order, but unless the weather should be quite clear the second route given would probably be the best to follow, as the objects forming the leading marks are so much nearer than Kilberry Point, which has to be clearly made out, as well as Sturraich Rocks from the southern entrance to the sound, when using the first given and more direct route.

**Cath Sgeir**, the most off-lying rock on the western coast of Gigha Island, is a narrow ledge nearly 800 yards north-northeast and south-southwest, which dries about 2 feet (0.6 m.); it lies 1.1 miles west-northwestward of Cairnleam Peak and 1,400 yards offshore. Duth Sgeir, a ledge which never covers, is situated 800 yards eastward of it, from which it is separated by a channel 600 yards wide, having depths of 8 to 20 fathoms (14.6 to 36.6 m.). The northeastern point of Cara Island open southwestward of Leam Island,  $120^{\circ}$ , leads southwestward, and North Dearg Sgeir just opening south-eastward of Garbh Island,  $28^{\circ}$ , leads northwestward of Cath Sgeir.

**Lightboat.**—A lightboat, which has a conical superstructure, and is painted red, is moored 400 yards west-southwestward of the northern end of Cath Sgeir. A flashing white light is exhibited, at 10 feet (3.1 m.) above the water, from the boat. (For details see Light List.) The light is unwatched.

**Red Rocks** ( $55^{\circ} 42' N.$ ,  $5^{\circ} 46' W.$ ), two in number, are small patches off the northwestern coast of Gigha Island; Outer Red Rock, with  $1\frac{1}{4}$  fathoms (2.3 m.) water, is  $\frac{1}{2}$  mile from the shore, and Inner Red Rock, awash at low water, lies 400 yards closer in. Toe Rock, with  $2\frac{1}{2}$  fathoms (4.6 m.) water, lies 300 yards south-south-westward of Outer Red Rock. The middle of Craro Island, open westward of Craigsheacan Point,  $186^{\circ}$ , leads westward, and North Dearg Sgeir, open westward of Garbh Island,  $41^{\circ}$ , leads northward of these rocks.

**West Loch Tarbert.**—The entrance to West Loch Tarbert lies about 4 miles eastward of the northern end of Gigha Island and is  $1\frac{1}{4}$  miles wide, north and south, between Ardrishaig and Ardpatrik Points. The loch is a narrow arm of the sea, 9 miles in length, trending northeastward, and its head is separated from East Loch Tarbert by a low isthmus  $\frac{3}{4}$  mile across.

Eilean Trein, 600 yards in length, north-northeast and south-south-west, lies  $\frac{1}{2}$  mile eastward from Ardpatrik Point and 300 yards from the northern shore of the loch, to which it is joined by a bank of gravel and boulders, dry at low water. The channel into the loch lies east-southeastward of this islet, and several rocks are situated within 400 yards from its southern and southeastern sides. The width of the channel abreast the islet is about 350 yards, with depths of from 3 to  $5\frac{1}{4}$  fathoms (5.5 to 9.5 m.).

There is no good leading mark through, but vessels should always borrow on the southern shore, which in the actual narrows may be approached to 200 yards. Within Eilean Trein the edge of the foul ground turns northward toward Argylls Mound; good anchorage may be had in 5 fathoms (9.1 m.), about 300 yards off the Ferry Pier under Argylls Mound. The northern shore from off Argylls Mound trends northeastward  $2\frac{3}{4}$  miles to Dunmore, where the channel is 600 yards wide.

Dun Skeig, a hill on which is a vitrified fort, rises on the south-eastern shore abreast of Eilean Trein, and fronting it a shoal of gravel and boulders commences and fringes the shore past Portachoillean Pier, from which it increases in breadth, attaining a width of 300 yards off Corran Point. The channel above Portachoillean is on the northern side of the loch.

From Corran Point the shore recedes eastward and forms a bay, which is filled with the shoal which extends nearly 800 yards from the beach to a cluster of small rocks, awash at high water. From these rocks the shoal gradually approaches the shore, and to Kilchamaig Point, a distance of nearly 2 miles, it extends off only about 100 yards.

**Depths.**—The depth of water in the narrows abreast Eilean Trein is from  $5\frac{1}{4}$  to 8 fathoms (9.6 to 14.6 m.), deepening to 10 fathoms

(18.3 m.), a mile within. Northward of Portachoillean Pier is a deep hole  $\frac{1}{4}$  mile long with from 15 to 19 fathoms (27.4 to 34.8 m.). There is a least depth of 5 fathoms (9.1 m.) in the fairway for  $\frac{1}{2}$  mile above Dunmore, and thence the depth gradually decreases to 3 fathoms (5.5 m.) abreast of Eilean da Laggan, above which there are depths of from 2 to 1 fathom (3.7 to 1.8 m.).

**Sgeir Mhannaidh** ( $55^{\circ} 47' N.$ ,  $5^{\circ} 32' W.$ ), a small rock which dries at half tide, lies 200 yards from the northern shore, 1.3 miles north-eastward of Barnacrich Point, which is situated 1,200 yards northeastward of Argylls Mound. The low-water line extends nearly 200 yards from the northern shore abreast of Dunmore House, but only 100 yards for a considerable distance farther up. A ferry crosses the loch from near Dunmore House to Kilchamaig Point.

**Black Rocks**, 700 yards northeastward of Kilchamaig Point, are a rocky patch 200 yards in extent awash at high water.

**Eilean Druigh**, 1 mile above Dunmore Point and 400 yards from the northern shore of the loch, is small with depths of 3 fathoms (5.5 m.) around. A curved chain of detached rocks extends between this islet and Eilean Maaey, on the northern shore 1,600 yards farther up. The narrowest part of the navigable channel southeastward of these rocks is 600 yards wide.

Depths of 3 fathoms (5.5 m.) have been obtained at 300 and 900 yards southwestward of Eilean Eoin. As shoaler water may exist in this vicinity, caution is necessary.

**Eilean Eoin**, abreast Eilean Maaey, and 200 yards off a point on the southeastern shore, is 200 yards long, steep-to on its northwestern side, and the channel between it and the northeastern of the rocks extending from Eilean Druigh is  $\frac{1}{4}$  mile wide.

**Sgeir a Bhile**, 900 yards above Eilean Maaey and 200 yards off-shore, is a small detached rock awash at high water. The channel between it and the southeastern shore is 400 yards.

**Sgeir Liath**,  $\frac{1}{2}$  mile north-northeastward of Sgeir a Bhile, is one of a cluster of rocks lying 500 yards from the northwestern shore, and within 400 yards from the southeastern shore, along which is the channel. Sgeir Liath is 400 yards from a point extending south-southwestward on the northwestern side, with a small bay westward of it.

**Eilean da Laggan** ( $55^{\circ} 50' N.$ ,  $5^{\circ} 28' W.$ ), 400 yards long, lies close to the northwestern shore above the point just mentioned, and 300 yards from the southeastern shore; thence to the quay at Tarbert, 1,600 yards farther up the loch, the narrow channel between its shores and banks is clear.

**Tides and tidal currents.**—It is high water, full and change, in West Loch Tarbert at 2h. 30m., but the rise is very irregular,

varying from 1 to 4 feet. With strong westerly and southwesterly winds the water remains almost constantly at the usual high-water level, and a contrary effect is produced by strong northerly winds. The flood current sets northeastward from Gigha Sound into West Loch Tarbert, and in the entrance narrows it attains a rate of 2 knots, at 2 miles farther up of  $1\frac{1}{2}$  knots, whence to the head of the loch it decreases in strength. The rate of the ebb current is somewhat greater, near the entrance narrows attaining a rate of 3 knots, and it runs toward and through Gigha Sound. The currents turn with those in Gigha Sound.

**Directions.**—When approaching the entrance to West Loch Tarbert, do not shut in the northern land with Ardpatrik Point until Barnacrich Point is in range with the southeastern side of Eilean Trein; then steer for Dun Skeig and close the southeastern shore to about 400 yards. Proceed along the southeastern shore at a distance of from 300 to 400 yards until nearly abreast of Portachoillean Pier, when steer for Ardpatrik House until about 400 yards off the shore under Argylls Mound; then bring Barnacrich Point gradually on the port bow and keep the northern shore aboard to abreast of Sgeir Mhannaidh, whence steer in mid-channel through the narrows abreast of Dunmore House. Then steer for Eilean Eoin, with Corran Point seen midway between the Narrows of Dunmore as a leading mark astern, on which range there is a good temporary anchorage in 4 fathoms (7.3 m.), mud, between Black Rocks and Eilean Eoin, but shoaler water has been obtained in this locality.

Above Eilean Eoin the channel becomes contracted and gradually shoals, but vessels of 15 feet draft ascend to Eilean da Laggan and those of 9 feet draft to the head of the loch. There is good anchorage in from  $1\frac{1}{2}$  to 2 fathoms (2.7 to 3.7 m.) north-northeastward of Eilean da Laggan and nearly  $1\frac{1}{2}$  miles from the head of the loch.

**The coast** from Ardpatrik, the northern point of the entrance to West Loch Tarbert, trends northward about 1,200 yards to Eilean Liath, a small rock close to the shore, and it is steep-to, but northward of Eilean Liath and 300 yards from the shore are two detached sunken rocks, 100 yards apart, with deep water a short distance seaward of them. These rocks lie on the southern side of the entrance to Caent Sailean, a small bight open to the westward. This bight has within its entrance, 300 yards wide, from 4 to 2 fathoms (7.3 to 3.7 m.) water, but it is contracted by a chain of rocks extending halfway across from the southern shore. About  $\frac{3}{4}$  mile northward of Caent Sailean Bight is the entrance to Loch Stornoway.

**Loch Stornoway** ( $55^{\circ} 47' N.$ ,  $5^{\circ} 37' W.$ ) is nearly 1 mile deep northeastward and 700 yards wide.



It is extremely dangerous to attempt to enter the loch. *Sgier nan Coimhach* is a rock on a patch 400 yards long off the southern point, and detached rocks extend halfway across the loch from the northern shore toward this patch. The depths within the loch are from 6 to  $3\frac{1}{2}$  fathoms (11 to 6.4 m.), but it dries for a considerable distance from the head.

The coast from Loch Stornoway trends northwestward 1 mile. It then turns to the north-northwestward and north-northeastward to Eilean Traigh, just within the entrance to Loch Killisport, the distance by the coast being 7 miles. Although rocks do not extend more than 300 yards off this coast, it should not be closed to less than 600 yards.

The soundings for  $1\frac{1}{2}$  miles offshore between Loch Stornoway and Kilberry Point, a distance of about 2 miles, are very irregular, varying from  $4\frac{1}{4}$  to 11 fathoms (7.8 to 20.1 m.).

**Loch Killisport**, an arm of the sea extending northeastward nearly 5 miles, is  $1\frac{1}{2}$  miles wide abreast Knap Point, the northern entrance point, which may be approached to the distance of 200 yards on its southern side.

The southern shore of the loch is clear of shoals, and may be approached to 300 yards anywhere between Eilean Traigh and Maaey. Eilean Traigh is joined to the shore by a natural causeway of sand and boulders 200 yards wide, which dries at low water. Eilean Maaey lies close to the shore about  $1\frac{3}{4}$  miles farther up the loch and just 1 mile below the innermost anchorage.

**Depths.**—The general depths in the fairway of the loch are from 13 to 10 fathoms (23.8 to 18.3 m.) in the entrance, decreasing to 6 fathoms (11 m.) at about 1 mile from its head, and to 3 fathoms (5.5 m.) 600 yards farther up. The bottom is remarkably even, Loch Caolas, a shoal spot of  $4\frac{1}{2}$  fathoms (8.2 m.) surrounded by depths of from 6 to 8 fathoms (11 to 14.6 m.), lying 600 yards southeastward from the southwestern end of the northern Eilean Traigh, being the only out-lying shoal.

**Knap Point** ( $55^{\circ} 53' N.$ ,  $5^{\circ} 41' W.$ ), the northern entrance point, though steep-to on its southern side, has several rocks on its western and northern sides and broken rocky ground close to the point. Bow of Knap, a small rock which dries 2 feet (0.6 m.), lies about 700 yards southwestward of Knap Point and is almost connected with Back Bow, a rocky patch 200 yards southward of it, the two patches together being about 300 yards in extent northward and southward. At 600 yards northward of Bow of Knap and 800 yards offshore is Ruadh na Brogg, a sunken rock, and between it and the shore is Glas Eilean, a small inlet connected to the shore by shallow water.

The southwestern end of Liath Eilean open of Knap Point,  $59^{\circ}$ , leads 200 yards southward of Back Bow. Danna House, near the southern end of Danna Island, in range with the northeastern extremity of Eilean nan Leac,  $6^{\circ}$ , leads close westward of these rocks.

**Liath Eilean**, about  $\frac{1}{2}$  mile within Knap Point, is a narrow island 600 yards long parallel with the shore. A rocky spur extends southwestward about 200 yards from its southwestern end, and the distance between it and the shore, which is steep-to, is  $\frac{1}{4}$  mile.

Nearly 200 yards southeastward of the northeastern point of the island is a detached rock with 4 feet (1.2 m.) water, and there is also a low-water rock 200 yards southeastward of the southwestern point. On the inner shore of the northeastern point is a high-water rock about 200 yards in extent.

**Eilean Traigh**, a small island farther up the loch, a few yards off the northern shore and about 1 mile distant from the islet of the same name on the southern shore, is the eastern point of Mulean Eiteig Bay, which affords good anchorage and shelter from south-westerly and westerly winds. About 600 yards farther up the loch is Eilean nam Muc, close to the northern shore; nearly 200 yards southeastward of the island is a detached 2-fathom (3.7 m.) patch.

**The northern shore** of Loch Killisport, above Eilean nam Muc is clear of shoals till near its head, where is Eilean na Huamh, a small islet. Eilean Fad, a small islet, lies near the middle of the loch,  $\frac{1}{4}$  mile southward of Eilean na Huamh.

**Tides and tidal currents.**—It is high water, full and change, off the entrance to Loch Killisport at 3h. 30m., with an irregular rise of from 2 to 6 feet.

Northward of West Loch Tarbert, the north-going current runs from about  $3\frac{1}{2}$  hours after high water to  $2\frac{1}{2}$  hours before the next high water, at a rate of  $2\frac{1}{4}$  knots at springs, and the south-going current from  $2\frac{1}{2}$  hours before to  $3\frac{1}{2}$  hours after high water at a similar rate.

The rate of the north-going current in the entrance to Loch Killisport is about 1 knot, that of the south-going being  $1\frac{1}{2}$  knots. Both currents decrease in rate as the loch is entered, and within Eilean nam Muc are scarcely perceptible.

**The coast.**—About 2 miles north-northwestward of Knap Point is the entrance of Loch Swen ( $55^{\circ} 56' N.$ ,  $5^{\circ} 41' W.$ ), and halfway between is Kilmorey Bay, about 600 yards wide, but not suitable for anchorage, though clear of sunken rocks, it being open to westerly winds.

**Eilean nan Leac**, a narrow island, 600 yards northeast and southwest, lies on the eastern side of the southern channel into Loch Swen. Flat Rock, which dries, lies 400 yards southward from the south-

western end of Eilean nan Leac, and 600 yards northeastward of it is Sgeir Beg, a small rock, connected to the shore by shoal water. A reef extends 300 yards from Sgeir Beg toward Flat Rock. The passage eastward of Eilean nan Leac is 300 yards wide, with depths of from 2 to 4 fathoms (3.7 to 7.3 m.).

**MacCormaig Isles**, off the entrance to Loch Swen, are several small islands and rocks extending  $1\frac{1}{4}$  miles east and west. Eilean More, the outer and largest island of the group, is 800 yards long, north and south. Near its southern end is a mound surmounted by a cross, and near the middle of the island are the ruins of an ancient chapel, perhaps one of the most complete of the ecclesiastical remains now existing in the western islands.

Two detached rocks above water extend 400 yards southwestward of this island, and a rock, with  $1\frac{1}{4}$  fathoms (2.3 m.) water, lies 100 yards off its northern end, but the coasts of Eilean More are otherwise clear. There is a good boat harbor on the northeastern side of the island 300 yards in depth.

Corr Eilean and Eilean nan Gamhna, the two inner islands of the group, lie close together, and are separated from Eilean More by a passage 600 yards wide. A spit with from  $3\frac{1}{2}$  to 5 fathoms (6.4 to 9.1 m.) water extends 700 yards northward from Corr Eilean, the western of the two islands.

**Corr Rocks**, a cluster 200 yards in extent, with  $\bar{5}$  feet (0.9 m.) least water, lie in the northern part of the passage between Eilean More and Corr Eilean, about 600 yards north-northeastward from Eilean More and 400 yards westward from the northern end of Corr Eilean, with deep water in the channels between. The passage between the islands should not be taken, except from necessity. Knap Point, open west-southwestward of Corr Eilean,  $143^\circ$ , leads westward of Corr Rocks.

**Tidal currents.**—The south-going current runs at a rate of 4 knots immediately westward of and through the MacCormaig Isles, and  $3\frac{1}{2}$  knots between that group and the mainland, while the north-going current runs at a rate of from 3 to  $3\frac{1}{2}$  knots past Loch Keills. The north-going current runs from  $5\frac{1}{4}$  hours after high water to three-quarters of an hour before the next high water, and the south-going from three-quarters of an hour before until  $5\frac{1}{4}$  hours after high water.

**Loch Swen** ( $55^\circ 56' \text{ N.}$ ,  $5^\circ 41' \text{ W.}$ ), about  $8\frac{1}{2}$  miles in length, with an average breadth of  $\frac{1}{2}$  mile, trends north-northeastward from its entrance, into which there are two channels, one southwestward, the other northward, of the MacCormaig Isles. The southern channel is 800 yards wide, but the northern channel is only 400 yards wide between the 5-fathom (9.1 m.) curves, and

Keills and Danna Rocks, as well as others nearer Danna Islands, render great caution necessary in its navigation.

On the southeastern shore of the loch, 2 miles within Eilean nan Leac, is the ruin of Castle Swen, from which a ferry crosses to a pier on the opposite shore. At  $1\frac{3}{4}$  miles above Castle Swen, off Dun Rostan farm, 200 yards from the shore, are some rocks which dry 1 foot (0.3 m.) at low water. Thence to Eilean Lon the distance is  $2\frac{1}{4}$  miles, and to the head of Sailean More, the main arm of Loch Swen, is a farther distance of  $2\frac{1}{2}$  miles.

The northwestern shore of the loch from within Lochfoot Rock is almost straight for 6 miles to a point just beyond Eilean Lon, northward of which is a small bay receding about 700 yards, with good anchorage in about 9 fathoms (16.5 m.) mud. At the head of the bay is a narrow passage leading into an inner basin, on the shore of which is the village of Tayvallich, with a quay to facilitate the landing of goods.

A channel trends northeastward from the northeastern side of the bay, and is in places for the distance of a mile, only 50 yards broad; it then opens out to a breadth of 300 yards for another mile; in the narrow passage there is a depth of 1 fathom (1.8 m.) but it deepens in the wider part to 4 and 6 fathoms (7.3 and 11.0 m.).

**Depths.**—The depths in the entrance to Loch Swen are about 9 fathoms (16.5 m.), decreasing in the loch to from 6 to 4 fathoms (11 to 7.3 m.) at  $\frac{1}{2}$  mile above Lochfoot Rock. Then the water again deepens, and the fairway depths are from 7 to 13 fathoms (12.8 to 23.8 m.) to the head of the loch, with the exception of two central patches of 4 and  $4\frac{1}{2}$  fathoms (7.3 and 8.2 m.) at 1,400 and 700 yards, respectively, south-southwestward of Sgeir na Anna.

**Lochfoot Rock** ( $55^{\circ} 56' N.$ ,  $5^{\circ} 42' W.$ ) is the largest of a group of small rocks extending south-southwestward in almost a continuous line from the shore of a little within the northern entrance point to Loch Swen. A spur extends 250 yards southeastward from the rock. The southern end of Eilean More in range with the southern end of Corr Eilean,  $240^{\circ}$ , leads southward of the spur.

**Sgeir na Anna**, a small rock which covers at high water in the middle of a patch 300 yards long, lies in mid-channel 3 miles above Lochfoot Rock. To pass north-northeastward of the rock when it is covered keep about 300 yards off the northwestern shore, as there is no well-defined clearing mark.

**Eilean Lon**,  $5\frac{1}{2}$  miles above the loch entrance and 150 yards off the southeastern shore, is nearly 800 yards long, north-northeast and south-southwest, and 90 feet (27.4 m.) high. The small islet of Cala lies 100 yards west-northwestward of it. A passage leads between the island and the end of a peninsula into the eastern of the several branches into which the head of the loch is divided. The

eastern branch is a land-locked harbor 800 yards broad, with good anchorage in any part. On its southeastern shore is the small hamlet of Kilmichael Inverlussa, with kirk, manse, and school.

**Anchorage.**—There is good anchorage in any part of Loch Swen above Castle Swen, but as northerly winds frequently blow hard the northwestern shore is to be preferred.

**Tides and tidal currents.**—It is high water, full and change, off the entrance to Loch Swen at about 3h. 30m., with an irregular rise of from 2 to 6 feet.

The current runs into Loch Swen from  $5\frac{1}{4}$  hours after high water until three-quarters of an hour before the next high water, and out of it from three-quarters of an hour before until  $5\frac{1}{4}$  hours after high water. Within the loch the rate of both ingoing and outgoing currents is from 1 to  $1\frac{1}{2}$  knots, decreasing until above Eilean Lon the currents are scarcely perceptible.

**Keills Rock**, with 4 feet (1.2 m.) water, is the outer rock in the northern approach to Loch Swen, and lies 700 yards  $246^\circ$  from the southern point of Liath Eilean, on the northwestern coast of Danna. At 800 yards  $138^\circ$  from Keills Rock is Danna Rock, detached, with 5 feet (1.5 m.) of water. Knap Point in range with the northeastern end of Eilean nan Gamhna,  $155^\circ$ , leads westward of both these rocks; and the land northward of Rudha na Cille open, bearing  $21^\circ$ , leads northwestward of them. The lime kiln at Keills, just open of Liath Eilean,  $31^\circ$ , leads between them.

**Loch Keills** ( $55^\circ 57' \text{ N.}$ ,  $5^\circ 43' \text{ W.}$ ), the entrance to which lies a little northward of the entrance to Loch Swen, between Liath Eilean on the south and Rudha na Cille on the north, is open to the south-southwestward; it is  $\frac{1}{4}$  mile wide and extends north-northeastward  $1\frac{3}{4}$  miles, of which more than  $\frac{1}{2}$  mile from the head of the loch dries at low water. There is a post office at Keills, situated about a mile from the anchorage.

**Anchorage.**—The loch affords anchorage in about 5 fathoms (9.1 m.), clay bottom, abreast of the lime kiln on the southeastern shore,  $\frac{1}{2}$  mile within the entrance. Farther in the water gradually shallows to the low-water line extending from the head of the loch.

The strong tidal currents setting across the entrance to the loch protect the anchorage from swell during southwesterly winds.

**Carraig nan Damb**, the larger and western of two small islets bearing  $356^\circ$ , distant nearly 2 miles from the western extremity of Eilean More, is about 300 yards in length north-northeast and south-southwest, and separated by a channel, with from 2 to 7 fathoms (3.7 to 12.8 m.) water, 150 yards wide, from the smaller islet to the southeastward. Both islets are steep-to.

**The coast** from Rudha na Cille trends northeastward in almost a straight line nearly 10 miles to Ardnòe at the entrance to Loch

Crinan. At 1 mile north-northeastward of Rudha na Cille is Keills Port, from which place the ferry, which takes the mails for Jura, plies to Lagg Bay.

At  $1\frac{1}{2}$  miles north-northeastward of Keills Port is the narrow inlet Sailean na h Airde, so encumbered with rocks and shoals as to be inaccessible, and  $1\frac{1}{4}$  miles farther northward is the commencement of a chain of islands and rocks lying parallel with the shore.

Liath Sgeir, about 200 yards in extent and  $\frac{1}{4}$  mile offshore, is the southwesternmost of this chain, which extends north-northeastward to the entrance of Charsaig Bay, a distance of 1.6 miles. The outer coasts of the group are steep-to, and between them and the mainland is a narrow passage rendered too intricate by rocks to be used without local knowledge.

**Charsaig Bay**, though of considerable extent, is open to the north-northwestward, and only affords anchorage for small craft in a little bight with 3 to  $1\frac{1}{2}$  fathoms (5.5 to 2.7 m.) immediately within Eilean Traigh, the islet forming the south-southwestern entrance point to the bay. The passage to the anchorage is 300 yards wide between a ledge of rocks extending from Rudha aoid Droinigh and a rocky ledge extending about 100 yards off the northeastern point of Eilean Traigh.

**Charsaig Island**, about  $\frac{1}{2}$  mile long, north-northeast and south-southwest, lies just northward of the bay, and in the channel between its southern end and the mainland, though only 150 yards across, anchorage for small vessels may be obtained in 7 or 8 fathoms (12.8 to 14.6 m.) with local knowledge.

**Ruadh More**, a rocky patch awash at low water, lies 200 yards from the shore, about 400 yards north-northeastward of Charsaig Island.

**Sailean More**, a bight  $\frac{1}{4}$  mile deep and 200 yards wide at its entrance, lies  $1\frac{1}{4}$  miles north-northeastward of Ruadh More and 2 miles from Ardnœ. The bight and its approaches are clear, and it affords shelter for small vessels, except during northerly winds, when a heavy swell is thrown in.

**Ruadh Rock Ledge** ( $56^{\circ} 04' N.$ ,  $5^{\circ} 40' W.$ ) is a series of detached rocks, all except South Rock, on a narrow ridge, 1.6 miles long north-east and southwest, within the 5-fathom (9.1 m.) curve, situated nearly in mid-channel at the northern end of the Sound of Jura. There are depths of from 16 to 26 fathoms (29.3 to 47.6 m.) within 400 yards on each side of the ledge.

**Ruadh Rock**, near the southwestern end of the ledge, is one of a group of several rocks above water and about 200 yards in extent, situated  $1\frac{1}{2}$  miles westward from Rudha na Barra, the western entrance point to Sailean More, and distant 1.9 miles from the coast of Jura.

A small detached rock, with  $1\frac{1}{2}$  fathoms (2.7 m.) least water and deep water close-to, situated 200 yards southwestward from Ruadh Rock, is the southwestern shoal of the ledge. A rock, dry at low water and part of a patch 200 yards long lies  $\frac{1}{4}$  mile northeastward from Ruadh Rock, with from 3 to 6 fathoms (5.5 to 11 m.) water between.

**Light.**—A flashing white light, 44 feet (13.4 m.) above water, visible 11 miles, is shown from a white beacon on the southern end of Ruadh Rock.

**South Rock**, with  $2\frac{1}{2}$  fathoms (4.6 m.) water, lies  $\frac{3}{4}$  mile northeastward of Ruadh Rock. It is detached from the main ledge, and there is a channel with from 11 to 15 fathoms (20.1 to 27.4 m.) water between it and a 3-fathom (5.5 m.) patch on the ledge 350 yards westward of it.

**North Rock**, with  $1\frac{1}{2}$  fathoms (2.7 m.) water, the northeastern shoal of the ledge, lies 1.1 miles north-northeastward from Ruadh Rock and 1.1 miles south-southwestward from Eairne Rock. The ledge continues for  $\frac{1}{2}$  mile north-northeastward of North Rock, there being a depth of  $5\frac{3}{4}$  fathoms (10.5 m.) at a distance of 700 yards from the rock; the channel between the 5-fathom (9.1 m.) curves extending from North Rock and Eairne Rock is clear.

**Clearing marks.**—Craignish Castle just in sight northwestward of the land of Craignish Point,  $32^\circ$ , leads  $\frac{1}{2}$  mile northwestward of the whole ledge; the southwestern end of Craignish Point in range with the northwestern side of the peaked islet of the Garraeasar Group,  $16^\circ$ , leads eastward of the North and South Rocks and of the whole ridge; and the northern part of Eilean na Vain, in Loch Crinan, open northward of Ardnœ,  $90^\circ$ , leads northward of North Rock, but over the ledge in about 6 fathoms (11.0 m.).

At night, after passing Sgeir Maoile Light, bring it to bear  $204^\circ$  and keep it on that bearing astern, which leads between Ruadh Rock Ledge and Jura, passing  $\frac{3}{4}$  mile west-northwestward of Carraig nan Damb and of Ruadh Rock Light.

**Tidal currents.**—Northward of Loch Keills the north-going current runs during the rising and the south-going current during the falling tide; the currents attain a greatest rate of from 3 to 5 knots at springs.

**Loch Crinan** ( $56^\circ 06' N.$ ,  $5^\circ 34' W.$ ) is a bay open to the northwestward, the entrance to which, between Rudha Minnard and Ardnœ, is 1.1 miles across, the loch receding  $1\frac{1}{2}$  miles southeastward. Add river flows into the southern end of the loch near the northern entrance to the Crinan Canal.

Between Ardnœ and the Crinan Canal the shore falls back to the southward and forms a bay, in which lies Eilean na Vain. Between

this island and the shore on its southeastern side is Crinan Harbor, suitable for vessels of light draft.

**Dubh Rock**, small and above water, is the middle of a cluster of rocks nearly 200 yards in extent, lying about 400 yards northward of the shore of Crinan near the inn, with from  $2\frac{1}{2}$  to 4 fathoms (4.6 to 7.3 m.) between it and the shore.

Two small islets near the head of the bay mark the edge of a broad flat of sand and mud extending from Crinan Point, at the mouth of Add River, to a point on which stands the old and picturesque castle of Duntroon.

**Tides**.—It is high water, full and change, at Crinan at 4h. 49m.; equinoctial springs rise 8 feet, ordinary springs 6 feet, and neaps 3 to 5 feet. The tidal currents are weak in Loch Crinan, but they run at a considerable rate across its entrance.

**Crinan Canal** extends from Loch Crinan to Ardishraig on Loch Fyne and is 9 miles in length. It was constructed (1793–1801) for the purposes of saving distance and avoiding the heavy seas so frequently encountered off the Mull of Cantyre. The saving in distance by vessels from the Clyde bound northward is some 85 miles, while there is also great saving of wear and tear.

There are 15 locks on the canal, each 96 feet long and 24 feet wide, with 10 feet (3 m.) of water on the sill, and the total rise is 64 feet. Vessels 88 feet long, with 20 feet beam and  $9\frac{1}{2}$  feet draft of water, can pass through all the locks. The sea lock at Crinan is 108 feet long and 26 feet wide, with 10 feet (3 m.) water on the sill; it can be entered at any state of tide, so that a vessel 100 feet long, 22 feet beam, and 10 feet draft, can be admitted to the basin there.

The canal is principally used for through traffic by small sea-going cargo steamers between Clyde ports or places on the Forth and Clyde Canal and ports in the West Highlands; also by steamers going via the Caledonian Canal either to places on that canal or to ports on the northeast coast; it also carries the local traffic of the district. The canal is government property, and is vested in and managed by the Ministry of Transport.

**Light**.—A fixed light, with white and red sectors, 25 feet (7.6 m.) above water, visible 4 miles, is shown at the entrance to the Crinan Canal. A signal light is displayed nearby. See Light List.

**Gallanach Bay**, northward of Duntroon Castle, is a narrow bight, with from 4 to  $1\frac{1}{2}$  fathoms (7.3 to 2.3 m.) water, clear of shoals, but open to southwesterly winds.

**Rudha Minnard** ( $56^{\circ} 07' N.$ ,  $5^{\circ} 34' W.$ ), the northern point of the entrance to Loch Crinan, is also the southern point of Loch Craignish; from it Craignish Point, the northern point of the



entrance to Loch Craignish, bears  $312^\circ$ , distant  $1\frac{3}{4}$  miles. Sunken rocks extend about 200 yards westward from Rudha Minnard.

**Rabbit Island**, nearly 400 yards west-northwestward of Rudha Minnard, is 400 yards long north and south, and steep-to around, with a deep channel between it and the shore.

**Garraesar Island**, 600 yards south-southwestward from Craignish Point, with Dorus More, a clear and deep channel between, is 900 yards long northeast and southwest, about 300 yards broad and 136 feet (41.5 m.) high.

Ris an Valle and Fairne Rock, with numerous islets, rocks, and shoals, extend 1,800 yards south-southwestward of Garraesar.

Maoile Rock is in the middle of a narrow rocky shoal,  $\frac{1}{4}$  mile in length, running parallel with the Garraesar Islands and lying about  $\frac{1}{4}$  mile west-northwestward of Ris an Valle, the channel between having depths of from 8 to 23 fathoms (14.6 to 42.1 m.). The shoal is steep-to.

**Ris an Tru**, an island situated 1,800 yards westward from the southwestern extremity of Craignish Point, is nearly  $\frac{1}{2}$  mile long north and south, 300 yards wide, and 81 feet (24.7 m.) high. It is steep-to, except that a rocky reef extends 250 yards from its southern end.

**Light.**—A flashing white light is shown from a white cylinder on a concrete base on the southern end of Ris an Tru.

**Shoal.**—A shoal with 4 fathoms (7.3 m.) least water lies  $308^\circ$ , distant 1,100 yards from Maoile Rock. Shuna Cottage, just open westward of Corr Easar,  $8^\circ$ , leads through the fairway westward of Maoile Rock.

**Tidal currents.**—The tidal currents attain a rate of from 6 to 8 knots at springs in Dorus More, and through the other channels between Garraesar Island and Ruadh Rock of 5 to 6 knots, running northwestward toward the Gulf of Corryvreckan from about 5 hours after high water to 1 hour before the next high water, and southeastward from about 1 hour before to 5 hours after high water. The northwest-going current after passing the Dorus More sets partly between Ris an Tru and Corr Easar, and partly northeastward between those islands and the mainland northward of Craignish Point, toward Shuna; the part setting between Ris an Tru and Corr Easar makes for the Gulf of Corryvreckan, another part runs toward Scarba Sound, and the remainder goes into Lochs Shuna and Mel-fort.

**Loch Craignish** ( $56^\circ 08' N.$ ,  $5^\circ 35' W.$ ) extends 5 miles northeastward from its entrance,  $1\frac{3}{4}$  miles wide, between Rudha Minnard and Craignish Point. A chain of islands runs parallel with the

southeastern shore of the loch for nearly  $3\frac{1}{2}$  miles. The main entrance is northwestward of these islands, but the width of the upper half of the loch is much contracted by the islands on both shores.

There is regular communication by steamer with Glasgow.

**Depths.**—In the main entrance to Loch Craignish the depths are from 20 to 40 fathoms (36.6 to 73.2 m.); the water, however, shoals rapidly to 13 and 6 fathoms (23.8 to 11 m.), and the 5-fathom (9.1 m.) curve is abreast of Port nan Lion, where the width of the channel is 1,500 yards, and for  $\frac{1}{2}$  mile farther up the depths are from  $3\frac{1}{2}$  to 4 fathoms (6.4 to 7.3 m.). Then the channel becomes from 400 to 600 yards wide, and the water again deepens to from 5 to 9 fathoms (9.1 to 16.5 m.) (with the exception of the shoal patches), and at the head of the loch it opens out into a bay, 1,200 yards in length northeast and southwest, and 800 yards broad, with good anchorage in 6 to 8 fathoms (11 to 14.6 m.) mud bottom.

The channel between the southeastern islands and the shore is in places little more than 200 yards wide and varies greatly in depth, but is, on the whole, considerably deeper than the main channel, there being not less than 8 fathoms (14.6 m.) in the fairway. It is navigable and affords good anchorage in places.

**Liath sgeir More**,  $\frac{1}{2}$  mile northward of Rabbit Island, is an islet at the southwestern end of the chain of islands running parallel to the southern shore of the loch. It is 600 yards distant from Macaskan Island, the island to the northeastward, but the passage between is occupied by rocks above water and sunken rocks. Several small rocks above water extend 300 yards south-southwestward from the islet, and, except toward the islet, the water deepens to 20 and 40 fathoms (36.6 to 73.2 m.) within the distance of 200 yards around them.

**Macaskan Island** ( $56^{\circ} 08' N.$ ,  $5^{\circ} 34' W.$ ) is 1 mile long northeast and southwest, with a greatest width of 600 yards. Righ Island lies 600 yards northeastward, but between are Gabhar Island and several rocks, leaving only a small boat passage.

The northwestern coast of Macaskan Island is clear and steep-to, but there are several patches near its southeastern coast, one of which is a detached patch with 3 feet (0.9 m.) water nearly opposite Brenport Farm. To clear it, keep on the southeastern shore of the channel.

**Righ Island**, the northeastern of the chain, is 1.6 miles long, 400 yards wide, and 176 feet (53.6 m.) high near its southwestern end. The northwestern and southeastern coasts of this island are clear, but two detached sunken rocks lie 100 yards off its northeastern end, leaving a navigable channel 400 yards wide between them and the southeastern shore of the loch near Ormaig Farm.

Here is a snug, landlocked anchorage, in about 8 fathoms (14.6 m.), with the northern end of Righ Island in range with the southern end of Macnevan Island.

**Port nan Lion**, a little bight on the northwestern shore of the loch, about  $\frac{3}{4}$  mile within Craignish Point, affords temporary anchorage to small vessels, but a small rock, with 1 fathom (1.8 m.) water, lies in the entrance, 200 yards from the northeastern point of the port.

**More Island**, 1,200 yards long north-northeast and south-southwest, with a greatest breadth of 300 yards, and 156 feet (47.5 m.) high, is  $2\frac{1}{4}$  miles above Craignish Point and 700 yards from the northwestern shore, near Garlocharran Farm. Buidhe Island, which is joined to the shore at low water, lies within its southwestern end.

**Black Rock**, 300 yards south-southwestward from the southwestern end of More Island, is small and seldom covers; 200 yards south-southwestward of it is a rock, which dries at low water.

A  $4\frac{3}{4}$ -fathom (8.7 m.) patch lies in mid-channel eastward of Black Rock.

**Macnevan Island** ( $56^{\circ} 10' N.$ ,  $5^{\circ} 32' W.$ ), 1.2 miles in length, parallel with the shore, is 200 yards north-northeastward of More Island, but a cluster of rocks extending from More Island leaves a 3-fathom (5.5 m.) passage close to Macnevan Island about 50 yards wide. The northeastern end of Macnevan Island is also separated at high water from the mainland by a passage only 50 yards wide, and along its northwestern coast runs a sandy beach, which at low water is almost joined to a similar beach extending along the mainland, while its southeastern coast is steep-to. Its northeastern point is distant 800 yards from the southeastern shore of the loch.

Black Rock lies 250 yards southward from the eastern point of Macnevan Island and dries at low water, but about midway between the rock and the southeastern shore is a small rocky patch with  $2\frac{1}{2}$  fathoms (4.6 m.) water and 8 fathoms (14.6 m.) close-to.

Between these rocks and the head of the loch is a clear basin affording anchorage in about 6 fathoms (11 m.) water. Within Iscan Island, which lies nearly 200 yards from the upper end of Macnevan Island, there is also good anchorage in from 2 to  $3\frac{1}{2}$  fathoms (3.7 to 6.4 m.).

**Tidal currents.**—A part of the north-going current passing eastward of the Garraeasar Islands enters Loch Craignish, and at  $\frac{1}{2}$  mile within the loch it has a rate of 2 knots at springs, but it quickly decreases to 1 knot. At the head of the loch the current is scarcely perceptible.

**Islay and Jura**, forming part of the county of Argyll, are separated by the Sound of Islay, but together extend nearly 40 miles

north-northeastward from Maol na Ho, the southern extremity of Islay. While Maol na Ho is distant 19 miles from the peninsula of Cantyre, the eastern coasts of these islands so close in with the peninsula that the northern half of the eastern coast of Jura is distant only from 3 to 4 miles from it.

**Islay** is 22 miles in length, north-northeast and south-southwest with a greatest breadth of 18 miles. The general surface of the island is undulating, and a marked contrast with the sharp pyramidal mountains of Jura. The highest peak in Islay is Ben Bhan ( $55^{\circ} 43' \text{ N.}, 6^{\circ} 08' \text{ W.}$ ), 1,541 feet (469.7 m.) high,  $3\frac{1}{2}$  miles westward of McArthur's Head, the western point at the southern entrance to the Sound of Islay, but the ridges of the coast hills are generally of moderate height.

The broad and deep indentation of Loch Indail, on the southwestern coast, trends northeastward 9 miles from the southwestern point of the island and is separated from Loch Ghruinnard, an opening on the northern coast, by an isthmus 2 miles broad.

The northwestern coast of Islay is rocky, affords no shelter, and should not be approached except during fine weather.

The population of Islay was 6,496 in 1921.

**Jura** is 24 miles in length, north-northeast and south-southwest, with a greatest breadth of  $6\frac{1}{2}$  miles. Its general aspect is that of a continuous mountain range uninterrupted by any visible plain or valley, the southwestern part rising to the Paps, three conical peaks, Ben an Oir, the highest of which, is 2,566 feet (782.1 m.), and the other two are somewhat lower.

Jura contains but little arable land, and the population, which was 461 in 1921, is scanty, considering the area of the island. The inhabitants are employed in fishing or in rearing cattle and sheep. There are several large flocks of goats and numerous red deer, especially on the southern part of the island.

On the southeastern coast, which is remarkably straight, are some spacious caves, with dry, level floors and lofty arched roofs.

**Light.**—A group flashing white light, 84 feet (25.6 m.) above water, visible 13 miles, is shown from a white beacon on Chuirn Island about 1 mile south of Ardmore Point.

**The east coast of Islay** from Ardmore Point trends northward for 5 miles to McArthur's Head ( $55^{\circ} 46' \text{ N.}, 6^{\circ} 03' \text{ W.}$ ). The bays of Ardmore, Kintour, and Claigeann, situated within 2 miles of Ardmore Point, are clear and afford temporary anchorage. Several rocks, the outer one being nearly 400 yards offshore, lie around Rudh Liath,  $2\frac{1}{2}$  miles northward of Ardmore Point. Beallach a Goach Point is situated  $\frac{1}{4}$  mile northward of Rudh Liath, and close off it is Fiagh Rock, awash at low-water springs. Between the

point and McArthur's Head is Proaig Bay, the shore of which is shoal in places to the distance of  $\frac{1}{4}$  mile.

**The Sound of Islay** is a deep channel about 11 miles long, with a least width of 800 yards, separating Islay and Jura in a general north and south direction. About midway a ferry plies between Port Askaig in Islay and Feolin in Jura.

The sound is not recommended to be used by heavy draft vessels as a number of sunken rocky patches with depths of 30 to 33 feet (9.1 to 10.1 m.) over them extend for a distance of nearly 2 miles in a central position at the northern end of the sound.

The sound is much frequented by vessels bound northward or southward to avoid the open sea westward of Islay. It is not recommended for anchorage, except in summer during fine weather, the tidal current being strong, and the bottom, very uneven in places, of gravel, rock, and shells encumbered with long seaweed, is not good holding ground. The southern entrance to the sound is between McArthur's Head, in Islay, and Rudha na Traille, the southern point of Jura,  $3\frac{1}{4}$  miles to the eastward.

**McArthur's Head**, the western point of the southern entrance to the Sound of Islay, is a steep cliffy projection. A reef, with depths of less than 5 fathoms (9.1 m.), extends about 400 yards eastward of the head.

**Light.**—A fixed white light, with red sector, 128 feet (39 m.) above water, visible 17 miles, is shown from a white tower, 42 feet (12.8 m.) high, near the eastern extremity of McArthur's Head.

The western shore of the sound is steep to at the distance of 200 yards, except off Rudha Mhail. Polanfheinn, Carraigataidh, and Polaigninnean Rocks are all close to the shore.

**Rudha na Traille** is the eastern point of the southern entrance to the Sound of Islay, and the shore from the point trends westward  $2\frac{1}{2}$  miles; it then gradually turns northward nearly 7 miles, when it again trends northeastward toward the entrance to Loch Tarbert.

The shore from Rudha na Traille to the small bight of Puill Cro,  $\frac{3}{4}$  mile to the westward, is a series of rocky spurs and coves.

**Brosdile Island** ( $55^{\circ} 47' N.$ ,  $6^{\circ} 00' W.$ ), off the western point of Puill Cro, and separated from it by a channel 200 yards wide, with depths of from 2 to 5 fathoms (3.7 to 9.1 m.), is 650 yards long, north and south, 300 yards broad, and 114 feet high. Several rocks lie less than 200 yards off the northwestern coast of the island, and thence a line of shoals extends along its western and southwestern sides. A narrow detached shoal, about 200 yards in extent, with a least depth of less than 6 feet (1.8 m.), lies 550 yards southwestward from the southern end of Brosdile Island, and the coast southeastward of Glas Eilean open southwestward of the boathouse on Farland Quay,  $303^{\circ}$ , leads southwestward of it. There is a  $3\frac{1}{4}$ -fathom:

(5.9 m.) shoal close westward of the above-mentioned shoal, and also some shoal patches off the east coast of Brosdile Island. At night the shoal is covered by the red sector of McArthur's Head Light. (For details see Light List.)

Between Puill Cro and Farland Quay, on which stands a boat-house, a distance of  $1\frac{1}{2}$  miles, the land falls back into a shallow bay, on the shore at the head of which is Jura House. In the depth of the bight, 250 yards offshore, is a shoal patch awash, with from 1 to 2 fathoms (1.8 to 3.7 m.) water inside it, and about  $\frac{1}{4}$  mile southward of this patch are two ridges, with least depths of  $2\frac{1}{4}$  fathoms (4.1 m.); the western of these ridges extends a distance of  $\frac{3}{4}$  mile from the shore.

**Fraoch Eilean**, 300 yards off Farland Quay, with a depth of 1 fathom (1.8 m.) in the channel between, is  $\frac{1}{4}$  mile in length, north-west and southeast, 300 yards broad, 63 feet (19.2 m.) high, and the ruins of a castle stand on its eastern end. A bank of gravel and rock runs off about 200 yards from the northwestern side and a spur of rocks extends 400 yards from its southern point. The small islet of Plóa lies midway between Fraoch Eilean and Jura.

**Black Rock**, which dries 5 feet (1.5 m.), lies  $\frac{1}{2}$  mile offshore 1,700 yards west-northwestward of Fraoch Eilean. A shoal, with many rocky heads that dry, extends  $\frac{1}{2}$  mile from Black Rock toward Fraoch Eilean.

**Light buoy**.—A large red boat-shaped buoy, with superstructure, exhibiting a flashing light, is moored 500 yards southwestward from Black Rock.

**Clearing marks**.—The southern rock above high water at Brosdile open southward of Fraoch Eilean,  $101^\circ$ , leads to the southward of the shoals extending southwestward of Black Rock; and Duisker Point open westward of Glas Eilean,  $345^\circ$ , leads westward of these shoals.

At night Black Rock is covered by the red sector of McArthurs Head Light.

**Glas Eilean**, nearly 1 mile northward of Black Rock and close to Jura, is a narrow grassy island about 400 yards long, northwest and southeast. Its low-water line on the inshore side almost joins that of the coast of Jura. Several rocks above high water extend 300 yards southward of the island.

**Polaiginnean Rock**, a detached long narrow rocky ledge, in a north and south direction, with a least depth of 9 feet (2.7 m.), is situated nearly 200 yards offshore on the west side of the sound, about  $1\frac{1}{4}$  miles southward of Port Askaig.

Rudha Mhail Lighthouse, bearing  $352^\circ$  and just open of Carraig More, leads about 100 yards eastward of the ledge.

**Macdougall Bay** ( $55^{\circ} 50' \text{ N.}, 6^{\circ} 05' \text{ W.}$ ), on the eastern shore of the sound, about  $1\frac{3}{4}$  miles northward of Glas Eilean, and southward of Feolin, affords good anchorage about 200 yards offshore in  $4\frac{1}{2}$  fathoms (8.2 m.) and inshore of the main tidal current, for here a part of the north-going current, pent up within the narrows, is thrown off and forms an eddy setting southward along the eastern shore. The northern point of Whitefarland Bay, just shut in with Feolin high-water line, is a line of direction for anchoring.

**Beacons.**—Two pole beacons, painted in black and white horizontal bands, with a diamond top mark, are situated at each end of the submarine cable between Jura and Islay, both at a distance of about 50 yards from the shore.

**Shoals.**—A rock, which dries 1 foot (0.3 m.), lies 180 yards north-northeastward of Rudha Mhail Lighthouse.

Two shoals, with a depth of 29 feet (8.8 m.) on each, lie 1,100 yards east-northeastward of Rudha Mhail Lighthouse.

A shoal of 31 feet (9.4 m.) lies 1,550 yards east-northeastward of the lighthouse.

A shoal of 29 feet (8.8 m.) lies 2,300 yards northeastward of the lighthouse.

**Port Askaig** ( $55^{\circ} 51' \text{ N.}, 6^{\circ} 06' \text{ W.}$ ), on the western shore, immediately opposite Feolin in Jura, with which it communicates by ferry, is a small bight with a depth of 2 fathoms (3.7 m.) close to the shore. It affords shelter for two or three small coasters alongside the quays. Steamers to and from Glasgow call here periodically, and to and from West Loch Tarbert daily.

**Caol Ila distillery**, situated about 800 yards to the northward of Port Askaig, has a tall chimney, and a number of white buildings which are conspicuous from the northward. There is a pier at the distillery.

**Whitefarland Bay**, on the eastern shore, about 1 mile northward of Feolin, affords sheltered anchorage out of the strength of the current, but the bottom, sand, rock, and weeds, is not good holding ground.

The best position for anchoring is in about 5 fathoms (9.1 m.) abreast a large bowlder on which a large anchor is cut, with Rudha Mhail Lighthouse in range with the northern point of the bay. There is a ring on the above bowlder, and a hawser can be laid out to the shore if desired. Whitefarland Bay is known locally as Inver Bay. Inver Cottage, at the northern end of the bay, is conspicuous.

An eddy sets northward along the shore of the bay for 10 hours in every 12.

**Bun na h abhain Bay**, on the western shore,  $2\frac{1}{2}$  miles northward of Port Askaig and 3 miles southward of Rudha Mhail, affords good

anchorage during westerly winds and is useful as a temporary anchorage for vessels awaiting slack water. The holding ground is better than in Whitefarland Bay. Just westward of the southern point of the bay is a distillery with a pier.

The best position for anchoring is in about  $5\frac{1}{2}$  fathoms (10.1 m.) with the distillery chimney bearing  $200^{\circ}$ , distant 600 yards, and out of the strength of the tidal currents.

**Rudha Mhail.**—From Bun na h abhain the western shore trends northward to Rudha Mhail, and the 5-fathom (9.1 m.) curve is distant from 200 to 400 yards; shoal water, however, extends eastward of Rudha Mhail, there being a depth of 3 fathoms (5.5 m.) 300 yards, and  $4\frac{1}{2}$  fathoms (8.2 m.) nearly 800 yards, from the point. There is a 5-fathom (9.1 m.) shoal about 1 mile  $82^{\circ}$  from Rudha Mhail Lighthouse.

**Caution.**—The depths between the above 5-fathom (9.1 m.) shoal and the  $4\frac{1}{4}$ -fathom (8.2 m.) patch are reported as generally less than charted.

**Light.**—A fixed white light with red sector, 147 feet (44.8 m.) above water, visible 18 miles, is shown from a white tower, 113 feet (34.4 m.) high, on Rudha Mhail.

**Storm signals** are shown from a flagstaff near the lighthouse.

**Telegraph cable.**—A telegraph cable crosses the sound about 1,400 yards northward of Bun na h abhain Bay.

**The eastern shore** from the sharp northern point of Whitefarland Bay to Rudha an Eorna, a distance of 1.2 miles nearly, has depths of less than 5 fathoms (9.1 m.) for 300 yards off it in places. The shore from Rudha an Eorna, irregular in outline and without any marked features, turns northeastward  $3\frac{1}{2}$  miles to Rudh'Aird na Sgitheich (Rudha nan Sgeachag), and its greater portion is fringed by shoal ground extending 600 yards off it in places. Thence the coast trends eastward to Rudha Chro-igan, the southwestern point of entrance to Loch Tarbert.

The whole of it is fronted by rocks and rocky ledges, which extend  $\frac{1}{4}$  mile off in places.

**Sgeir na Tragha** ( $55^{\circ} 55' N.$ ,  $6^{\circ} 05' W.$ ), a group of rocks off the eastern shore of the sound, which dries 11 feet (3.4 m.) and is seldom entirely covered, is situated  $1\frac{3}{4}$  miles northward from Rudha an Eorna, and  $3\frac{1}{2}$  miles off-shore. The high-water mark of Ruda an Eorna in range with the chimney of Caol Ila distillery,  $194^{\circ}$ , leads about 250 yards northwestward of the rocks.

**Outlying patches.**—A rocky patch, with a depth of  $4\frac{1}{4}$  fathoms (7.8 m.) and 6 fathoms (11 m.) around, lies in the fairway of the Sound of Islay, at a distance of 1,850 yards west of Sgeir na Tragha.

A patch of  $5\frac{1}{4}$  fathoms (9.6 m.), rock, lies on the west side of the northern approach to the sound, at the distance of 1,800 yards  $357^{\circ}$ .



from Rudha nan Sgeachag; the bottom is very irregular in the neighborhood of the latter patch.

**Tides and tidal currents.**—It is high water, full and change, at Feolin, at 4h. 41m.; springs rise  $6\frac{1}{2}$  feet, neaps  $4\frac{1}{4}$  feet; neaps range 2 feet.

In the southern approach to the sound, about  $1\frac{1}{2}$  miles eastward of Rudh Liath, the current runs to the northward from 5 hours after high water to 1 hour before the next high water, at a rate of  $1\frac{3}{4}$  knots at springs. In the narrows at Feolin the current runs to the northward from 4 hours and 50 minutes after high water to 1 hour and 10 minutes before the next high water, at a greatest rate of 5 knots at springs and  $3\frac{3}{4}$  knots at neaps, and to the southward from 1 hour and 10 minutes before to 4 hours and 50 minutes after high water at a greatest rate of 6 knots at springs and  $4\frac{1}{4}$  knots at neaps. In the northern approach to the sound, the north-going current runs from 5 hours 5 minutes after high water to 55 minutes before the next high water at a greatest rate of  $2\frac{1}{2}$  knots at springs, and the south-going current runs from 55 minutes before until 5 hours 5 minutes after high water. There is an eddy in Macdougall Bay which runs southward from low water until 3 hours after high water—a period of 9 hours. In Whitefarland Bay an eddy sets northward from three-quarters of an hour before high water until  $2\frac{3}{4}$  hours before the next high water. In the southern approach to the sound there is an eddy with the south-going current, and within Fraoch Eilean the north-going current runs from 4 hours and 20 minutes after high water to 1 hour and 40 minutes before the next high water, and the south-going current from 1 hour and 40 minutes before to 4 hours and 20 minutes after high water. There are overfalls during the south-going current off McArthur's Head.

In the northern approach to the sound there is an eddy with the north-going current northward of Rudha Mhail, which runs back to the eastward of that point, and with the south-going current there is slack water abreast of Loch Tarbert.

**Directions.**—In entering the sound from the southward, keep the western shore aboard, in order to clear Black Rock and the shoals extending east-southeastward from it, and leave Black Rock red conical light buoy on the starboard hand. Keep the southern high-water rock of Brosdile open southward of Fraoch Eilean,  $101^\circ$ , until Duisker Point opens west-southwestward of Glas Eilean,  $345^\circ$ , and thence steer in mid-channel through the sound. To avoid the sunken rocky patches occupying a central position at the northern end of the sound, the chimney of the distillery on the shore of Bun na h abhain Bay kept on the bearing  $197^\circ$  will lead westward of them.

**The southeast coast** of Jura from Rudha na Traille ( $55^\circ 48' N.$ ,  $5^\circ 58' W.$ ), forming the northwestern side of the Sound of Jura,

trends north-northeastward in almost a straight line with slight indentations for 21 miles to a headland, whence it trends northward for a farther distance of  $2\frac{1}{2}$  miles to its northern end. The average width of the Sound of Jura, abreast of the northern half of the island, is about  $3\frac{1}{4}$  miles.

**Cailleach Point**,  $2\frac{1}{4}$  miles north-northeastward of Rudha na Traille, is the southern point of the bay fronted by the Small Isles, the intervening coast being straight and fringed with numerous rocks, the most off-lying of which, with the exception of Cuilean Rock, are within 400 yards of the shore.

**Cuilean Rock**, 5 feet (1.5 m.) high, is one of several rocks rising from a plateau about 400 yards in extent, with deep water close around. It bears  $56^\circ$ , distant 2 miles, from Rudha na Traille, and there is a good navigable channel, 1 mile wide, between it and the island.

The rock is visible by day, but McArthurs Head Lighthouse well open of Rudha na Traille,  $244^\circ$ , leads southward of it. At night McArthurs Head Light is white to the southward of that line of bearing and red to the northward of it.

A shoal patch of  $4\frac{1}{2}$  fathoms (8.2 m.) lies  $23^\circ 1\frac{1}{2}$  miles from Cuilean Rock.

**Light**.—A flashing white light, 30 feet (9.1 m.) above water, visible 10 miles, is shown from a white structure on Cuilean Rock.

**Tidal currents—Rudha Mhail, Jura, and Colonsay area**.—Off Rudha Mhail the north-going current commences about half an hour before high water at Dover, setting between  $10^\circ$  and  $30^\circ$  until 4 hours after high water, attaining a greatest speed, in the third hour, of 2 knots at springs and about  $1\frac{1}{2}$  knots at neaps. Its direction from the fourth to the fifth hour is about northeast, and during the fifth and sixth hour after high water it turns to the southward (with either no interval at slack water or for 20 minutes at most) to  $190^\circ$ , gradually increasing in speed in that direction up to  $2\frac{1}{2}$  knots at springs at 4 hours before high water, after which it decreases, until the turn to the northward, with little or no slack water, slightly before high water at Dover, which is about the time of local low water.

The tidal wave that affects the north coast of Islay and the coast of Jura from abreast Rudha Mhail Lighthouse, northward of Shan (Shain) Bay, and the coast of Colonsay is a different one from that at Port Askaig in the Sound of Islay. It is high water at Port Askaig (about low water at Dover) at about half an hour before that at Rudha Mhail at springs, and nearly three-quarters of an hour at neaps, and the Port Askaig low waters are nearly a quarter of an hour before the low waters at the lighthouse. But it is the difference in ranges that is most remarkable, considering the fact that the two

places are only  $5\frac{1}{2}$  miles apart, for it is found that the range at the lighthouse is practically double that at Port Askaig, as follows:

Rudha Mhail, springs range 11 feet, neaps range 4 feet.

Port Askaig, springs range 6 feet, neaps range 2 feet.

From the tidal curves it is found there is an actual difference of level of from 1 foot to  $1\frac{3}{4}$  feet (generally the greater) at the time of high water, and of  $1\frac{1}{4}$  feet to  $2\frac{1}{2}$  feet at the time of low water. The water, therefore, rushes southward from half rise to half fall, and northward during the remainder of the time, until level surface is reached, between the oscillations. Since the difference of level is greatest at low water, the north-going current is consequently the stronger.

As regards the rise and fall northward of the Sound of Islay, the times of high and low water throughout the area Colonsay, west coast of Jura, and the north coast of Islay are practically identical, the greatest differences observed being a quarter of an hour either way between any of them.

The range of tide at all periods is identical throughout the area in question, namely, 11 feet at springs and 4 feet at neaps, neap rise being  $3\frac{1}{2}$  feet.

**The Small Isles** are five islets fronting a bay  $2\frac{3}{4}$  miles wide from point to point, and receding from 1,000 yards to nearly 1 mile, which affords shelter to vessels of moderate draft in places. The three principal islets lie in a direct line between the points of the bay.

**Goat Island**, the southwestern of the islets, is  $\frac{1}{2}$  mile in length, northeast and southwest. 84 feet (25.6 m.) high, and there is a building on it near the middle. Its southwestern point is less than 200 yards from a perch, a black iron pillar surmounted by a ball, on a spur of Liath Sgeir, a rock connected with the shore to the south-westward at low water.

**Anchorage.**—Between the perch and Goat Island is the entrance to a good though small anchorage, with 3 fathoms (5.5 m.) water, the depth in the entrance being  $2\frac{3}{4}$  fathoms (5.0 m.).

The anchorage is formed by a bank of sand and gravel, with from 1 to 2 fathoms (1.8 to 3.7 m.) water, which extends westward from the northern part of Goat Island and sweeps round the shore to the perch on Liath Sgeir. The bottom, sand and gravel, is covered in many places with grass, which renders it necessary, especially in winter, to guard against the anchor dragging.

On the shore of the bight westward of Goat Island there are some buildings, and a pier at the head of which there is about 1 fathom (1.8 m.) at high water. There are good roads leading from here both to the ferry at Feolin and also to that crossing to the mainland from Lagg, 7 miles farther northeastward.

There is regular communication by steamer with Glasgow, via West Loch Tarbert.

**Goat Rock** ( $55^{\circ} 50' \text{ N. } 5^{\circ} 56' \text{ W.}$ ), 300 yards southeastward of Goat Island, dries 1 foot (0.3 m.), and there are depths of from 3 to 5 fathoms (5.5 to 9.1 m.) between it and the island. Liath Sgeir Perch, well open of the southwestern end of Goat Island,  $260^{\circ}$ , leads southward of the rock, and Cnoc ant Sulair, 293 feet (89.3 m.) high, near Lowlandman Bay, in range with Eilean Lebheinn,  $21^{\circ}$ , leads eastward of it.

**Rabbit Island**, about  $\frac{1}{4}$  mile northeastward of Goat Island, is 82 feet (25 m.) high, and 300 yards northwestward from it is Pladda Island, nearly  $\frac{1}{2}$  mile distant from the coast of Jura, off which rocks and foul ground extend 650 yards, leaving a narrow 2-fathom (3.7 m.) passage between it and Pladda, the leading mark through being Cailleach Point just open westward of Goat Island,  $189^{\circ}$ . The passage between Goat and Pladda Islands has a depth of from 4 to 5 fathoms (7.3 to 9.1 m.), and within there is a space about 700 yards in extent with from 3 to 4 fathoms (5.5 to 7.3 m.), the water thence shoaling quickly toward the shore.

Eilean Lebheinn, 150 yards southeastward of Rabbit Island, is a rock about 100 yards in extent.

**Eilean Bhrìde**, northeastward, distant 1,300 yards from Rabbit Island, is 500 yards long and 85 feet (25.9 m.) high. Shoal water extends 300 yards from its northwestern side, but its southeastern side is steep-to. The depths between it and Rabbit Island are from 6 to 8 fathoms (11 to 14.6 m.), and there is a space over  $\frac{1}{2}$  mile wide, with from 3 to 7 fathoms (5.5 to 12.8 m.) between it and the shore of the bay. There is also a narrow channel between its northeastern end and Jura, with from 3 to  $4\frac{1}{2}$  fathoms (5.5 to 8.2 m.) water.

**Lowlandman Bay**.—About 1,400 yards northeastward from the northeastern point of the bay fronted by the Small Isles is the entrance to Lowlandman Bay, the intervening coast being faced by rocky islets and shoal water to a distance of 350 yards, beyond which the water deepens suddenly to 10 fathoms (18.3 m.). This bay is a refuge in southwesterly gales, and is by far the best anchorage on the southeastern coast of Jura, the depths varying from 3 to  $4\frac{1}{2}$  fathoms (5.5 to 8.2 m.), good holding ground. On the eastern shore of the bay is the lighthouse establishment connected with Sgeir Maoile.

**Nine-foot Rock**, 150 yards in extent, with depths of from  $1\frac{1}{2}$  to 2 fathoms (2.7 to 3.7 m.), lies  $153^{\circ}$ , distant 550 yards from the northeastern entrance point of the bay.

**Light buoy.**—A light buoy, with red and white horizontal bands, showing a group flashing white light, is moored on the southern side of the rock in 5 fathoms (9.1 m.).

**Clearing marks.**—Crackaig Hill in range with the apex of Goat Island,  $220^{\circ}$ , leads 250 yards southeastward of the rock, and the southwestern shoulder of Ben an Oir, in range with the north-eastern fall of Cnoc an Sulair, the western point of the bay,  $292^{\circ}$ , leads close southwestward of it.

These marks, however, might not be recognized by a stranger, and in thick weather they are obscured; then approach from the southward with the northeastern entrance point of the bay bearing  $3^{\circ}$ . In anchoring do not borrow on the eastern side of the bay, where abreast of the pier the 3-fathom (5.5 m.) curve extends 400 yards. A good berth is in about 4 fathoms (7.3 m.), in the middle of the bay, with the pier end on.

**Tides.**—It is high water, full and change, at Lowlandman Bay and the Small Isles at 5h. 3m.; springs rise  $3\frac{1}{2}$  feet, neaps  $2\frac{1}{4}$  feet.

**Sgeir Maoile (Iron Rock)** occupies nearly a central position in the Sound of Jura, being situated  $99^{\circ}$ , distant 1.9 miles from the north-northeastern entrance point of Lowlandman Bay. The rock is of small extent and is only a few feet high. The soundings a short distance off give no indication of its vicinity.

**Light.**—A flashing white light, 73 feet (22.3 m.) above water, visible 14 miles, is shown from a white tower, 83 feet (25.3 m.) high, on Sgeir Maoile.

**Fog signal.**—A fog signal is sounded at the lighthouse. See Light List.

**Tarbert Bay.**—Lagg Bay ( $55^{\circ} 56' N.$ ,  $5^{\circ} 51' W.$ ), from which place the mail ferry crosses to Keills Port on the mainland, is nearly 4 miles northeastward of the northeastern entrance point of Lowlandman Bay, and  $1\frac{1}{2}$  miles farther northeastward is Tarbert Bay, the intervening coast being steep-to, Sgeir Ghul an Rudha lying only 100 yards offshore 250 yards southward of the eastern point of Lagg Bay. Tarbert Bay, 700 yards in depth, is separated from the head of Loch Tarbert by an isthmus  $\frac{3}{4}$  mile wide. The bay, though accessible to small craft for temporary anchorage, should not entered without local knowledge, as there are several rocks both in it and in its entrance.

**Ardlussa Bay.**—About 3 miles northeastward from Tarbert Bay is Ardlussa Bay South, which affords good shelter from northerly winds, and 1.1 miles farther northeastward is Ardlussa Bay, a small bight suitable for small craft.

**One-and-three-quarter Fathom Rock**, nearly  $\frac{1}{4}$  mile offshore about  $2\frac{3}{4}$  miles northeastward of Ardlussa Bay, is small with deep

water around. Bar Bubh, the highest hill in Shuna Island, in range with the rocky extremity of Jura,  $24^{\circ}$ , leads 400 yards east-southeastward of the rock.

**Dubh Camus**, 5 miles northeastward of Ardlussa Bay, is a small bay clear of shoals, but the water is too deep to render it a desirable anchorage. Cointom Hill, 275 feet (83.8 m.) high,  $\frac{1}{2}$  mile north-eastward of Dubh Camus, rises from a rounded point, whence the coast turns northward to the northern end of the island. About  $\frac{1}{2}$  mile northward of Cointom Hill is a bight with good anchorage close inshore, in from 2 to 4 fathoms (3.7 to 7.3 m.) between its northern shore and a  $1\frac{3}{4}$ -fathom (3.2 m.) rock.

**Kinuachdrach Bay**, between 600 and 800 yards farther northward, is open to the northeastward, but affords good anchorage for small vessels with the wind from other directions in about 6 fathoms (11 m.) and about 200 yards from the shore. A rock with  $1\frac{1}{2}$  fathoms (2.7 m.) water lies about 200 yards north-northeastward from the southern point of the bay. There is a ferry between Kinuachdrach Bay and Little Loch Craignish on the mainland.

**Maol Islet**, about 1 mile northward of Kinuachdrach Bay, is a small rock almost joined to the coast of Jura, and thence the coast trends northwestward and westward for a distance of about 1,600 yards, round the northern end of Jura, to the entrance of Bagh nam Muc.

**Tidal currents—Jura Sound and southeast coast of Jura.**—In the fairway of Jura Sound the current runs northeastward from about  $5\frac{3}{4}$  hours before to about one-fourth hour after high water at a rate of  $3\frac{1}{2}$  to  $4\frac{1}{2}$  knots at springs and  $2\frac{1}{2}$  knots at neaps, and southwestward from about one-fourth hour after high water to about  $5\frac{3}{4}$  hours before the next high water at a rate of  $4\frac{1}{2}$  knots at springs and  $2\frac{1}{2}$  knots at neaps; but at  $\frac{3}{4}$  mile eastward of the Small Isles the current turns one-fourth hour earlier, and their rate is 1 knot at springs. Between the Small Isles and Jura the north-going current runs in westward of Goat Island, and out northeastward of Eilean Bhride from  $4\frac{1}{4}$  hours after high water until  $13\frac{3}{4}$  hours before the next high water, and in northeastward of Eilean Bhride and out westward of Goat Island from  $13\frac{3}{4}$  hours before until  $4\frac{1}{4}$  hours after high water; at a rate of 1 knot at springs. Farther northeastward, off Adlussa Bay South, the north-going current runs close inshore from  $5\frac{1}{2}$  hours after high water to one-half hour before the next high water, and the south-going current from one-half hour before until  $5\frac{1}{2}$  hours after high water. In all cases the water rises with the north-going and falls with the south-going current. At the northeastern end of Jura the north-going current turns westward through the Gulf of Corryvreckan.

The south coast of Islay from Ardmore Point, the southeastern point of the island, which is steep-to, takes a general southwesterly direction for  $10\frac{1}{2}$  miles to Rudha na Leac, and as far as Port Ellen, a distance of 7 miles, it is fringed with small islands and off-lying rocks extending in places  $1\frac{1}{2}$  miles from the shore.

**Chuirn Island**, the eastern islet of a group of islets and rocks, lies  $\frac{1}{2}$  mile offshore 1 mile southward of Ardmore Point; the group extends  $1\frac{1}{2}$  miles southwestward from Chuirn Island and shoals extend  $\frac{3}{4}$  mile southwestward of Bhride Island, which lies the same distance southwestward of Chuirn Island. Ardmore Point open eastward of Chuirn Island leads eastward of these rocks.

**Light**.—A group flashing white light, 84 feet (25.6 m.) above water, visible 13 miles, is shown from a white beacon on Chuirn Island.

**Iomallach Rock**, 8 feet (2.4 m.) high lies 1 mile southward of Rudha Port na Cuile, the southeastern point of Ard Imirei, a peninsula of Islay.

**Ruadh More**, a rock with  $1\frac{1}{4}$  fathoms (2.3 m.) water, lies 800 yards southwestward of Iomallach Rock. The space to the northward of Iomallach Rock and Ruadh More is filled with a group of islets and rocks.

**Texa Island**,  $1\frac{1}{2}$  miles southeastward of Port Ellen and  $\frac{1}{2}$  mile off the coast of Islay, is  $\frac{3}{4}$  mile long and 164 feet (50 m.) high at its eastern end. The passage between Texa and Islay is rocky and foul. A group of rocks, several of which are above water, extends about 1,200 yards southward from the western part of Texa. Tar Sgeir, the southern of these rocks, is 15 feet (4.6 m.) high.

**Otter Rock** ( $55^{\circ} 34' N.$ ,  $6^{\circ} 08' W.$ ),  $169^{\circ}$ , distant  $2\frac{1}{2}$  miles from the southern point of Texa Island, is a pinnacle, with 2 fathoms (3.7 m.) of water lying on a narrow bank running east and west with depths of  $5\frac{1}{2}$  to 10 fathoms (10.1 to 18.3 m.) on it, and 14 to 16 fathoms (25.6 to 29.3 m.) around. The sea breaks heavily on the rock during strong winds, especially with an opposing current, but the breakers are not continuous, being those known as blind breakers.

Port Ellen Lighthouse, bearing  $341^{\circ}$ , leads  $1\frac{1}{2}$  miles westward of the rock; Chuirn Island in range with Iomallach Rock,  $37^{\circ}$ , leads nearly  $\frac{1}{2}$  mile northwestward of it; and the summit of Sgor Voucharan well open eastward of Texa Island,  $352^{\circ}$ , leads eastward of it.

**Light vessel**.—A group flashing white light is exhibited, at 30 feet (9.1 m.) above the sea, from a light vessel moored in 16 fathoms (29.3 m.), with Otter Rock bearing  $14^{\circ}$  distant 900 yards, and should be seen from a distance of 10 miles. (For details see Light List.)

The light vessel is painted red with "Otter Rock" in white letters on her sides, and has a cylindrical superstructure carrying the lantern.

This light is unwatched, there being no crew on board, and should not be relied on.

A bell in a small superstructure is rung by the motion of the vessel.

**Port Ellen** (55° 38' N., 6° 12' W.), a small harbor on the southern coast of Islay, is open to the southeastward; the entrance is  $\frac{3}{4}$  mile wide, east and west, between Rudha na Eileanan and Carraig Fada, and the port runs back  $\frac{1}{2}$  mile.

A cluster of rocks extends westward and southward from Rudha na Eileanan, the eastern entrance point, in places for a distance of nearly  $\frac{3}{4}$  mile, and narrows the channel to considerably less than  $\frac{1}{2}$  mile.

Although numerous off-lying rocks, above and below water, contract the navigable entrance and increase the difficulty of approach, they impede the swell entering the bay.

There is a small bight within Rudha na Eileanan, and a stone pier 120 feet long runs out from the northern point of the bight into a depth of 4 feet (1.2 m.) at low water. At 250 yards westward of the pierhead is Sgeir na Ron, which does not cover, and the edge of the shallow water on its southern side is marked by a beacon.

No attempt to enter the port should be made without local knowledge.

**Light.**—A fixed white light, with red sector, 48 feet (14.6 m.) above water, visible 6 miles, is shown from a white tower on Carraig Fada Point, the western point of the entrance to Port Ellen.

**Anchorage.**—The general depth of the anchorage in Port Ellen is from 6 fathoms (11 m.) in the middle to 3 fathoms (5.5 m.) near the eastern and western shores. The best position is close to the village in  $3\frac{1}{2}$  fathoms (6.4 m.) with the Free Church on with the pier end. The northeastern part of the port is rocky, but from the Distillery Jetty round west-southwestward the ground is clear at 200 yards offshore.

**Tides.**—It is high water, full and change, in Port Ellen at 5h. 0m.; springs rise 5 feet, neaps 4 feet. The tidal currents are weak.

The village of Port Ellen stands on the shore around the small bight within the eastern entrance point. It had a population of 871 in 1911.

There is daily communication by steamer between Port Ellen and Greenock, via West Loch Tarbert, and by direct steamer twice weekly.



The coast from Port Ellen trends southeastward, and rocks extend about 1,200 yards off it within 1 mile from the lighthouse; thence it is clear at 200 yards offshore to Rudha na Leac.

**Tidal currents.**—The currents on the south coast of Islay from Ardmore Point to Maol na Ho are affected by the current running southward through the Sound of Islay, as well as by the current running southeastward from Maol na Ho. This latter current after passing Maol na Ho takes a more easterly trend and spreads out to the northward; off Texa Island it meets the south-going current from the Sound of Islay, and the combined currents move southward at a rate of 3 knots at springs toward the Mull of Cantyre.

At Otter Rock the current runs to the eastward from about high until low water, and to the westward from low until high water, with a rate of 3 knots at springs. Between Texa Island and the shore the currents have a rate of 2 to  $2\frac{1}{2}$  knots at springs.

**Maol na Ho** is the southern headland of Islay, and the coast from Rudha na Leac, its southeastern point, trends northwestward  $2\frac{1}{2}$  miles to Rudha na Cathair, its northwestern point. It is steep-to at the distance of 200 yards.

Oversay bears  $309^\circ$ , distant  $7\frac{1}{2}$  miles from Rudha na Cathair, and the entrance to the extensive inlet, which includes Laggan Bay and Loch Indail, lies between these points.

The coast of the Ho Peninsula trends northeastward nearly 4 miles from Rudha na Cathair to Rudha More; rocks and islets extend  $\frac{1}{4}$  mile off it in places.

**Laggan Bay** is about 4 miles wide and recedes nearly 2 miles between Rudha More and Laggan Head. It is open to the westward, and its shores are low and fringed with rocks extending  $\frac{1}{2}$  mile off in places.

Sliday Bank, a patch with 8 fathoms (14.6 m.) water, lies nearly 2 miles westward from Rudha More.

**Cnoc Angle Rock** ( $55^\circ 40' N.$ ,  $6^\circ 19' W.$ ),  $345^\circ$ , 1.3 miles from Rudha More, has a depth of  $3\frac{1}{4}$  fathoms (5.9 m.). It rises suddenly from depths of from 10 to 12 fathoms (18.3 to 21.9 m.), and the sea breaks heavily on the rock during strong westerly winds.

**Loch Indail.**—The southeastern coast of the Rhinns of Islay trends northeastward from its southern point, near Oversay, about 9 miles to the head of Loch Indail, a deep indentation. The coast is bold and steep-to as far as Port Charlotte, a village on the north-western side of the loch about 3 miles from its head.

The entrance to the loch is  $1\frac{1}{2}$  miles wide between the Rhinns Coast and Laggan Head. Within the entrance the loch opens out into a basin, extending  $4\frac{1}{4}$  miles east and west with a greatest breadth of  $2\frac{1}{2}$  miles and depths of from  $2\frac{1}{2}$  to 4 fathoms (4.6 to 7.3 m.) which afford anchorage with good holding ground. The eastern

part of the loch is shallow for a considerable distance, and the head of the loch dries out for 1,200 yards.

**Bogha n'tsaoir** is a rocky reef extending 1,000 yards south-westward from Laggan Head, the eastern point of Loch Indail. Cnoc Dun, the eastern and higher of two hills at the head of the loch, open of Saltpan Point,  $31^\circ$ , leads west-northwestward of the reef, and at night it is covered by the red sector of Dun Point Light.

**Lights.**—A fixed light, with white and red sectors, 50 feet (15.2 m.) above water, visible 12 miles, is shown from a white brick tower, 42 feet (12.8 m.) high, on Dun Point on the western side of the loch, about  $\frac{1}{2}$  mile northward of the village of Port Charlotte.

A fixed light with white and red sectors, 20 feet (6.1 m.) above water, visible 5 miles, is shown from the head of a small pier at Bruichladdich, about 1.1 miles northward of Dun Point.

**Anchorage.**—The best anchorage in Loch Indail is near the head, in 3 fathoms (5.5 m.) sand, with Bowmore House bearing about  $138^\circ$ . The anchorage is covered by a white sector of Dun Point Light.

Loch Indail affords but indifferent shelter. Vessels drawing 10 feet (3.1 m.) or less may get far enough in to be protected, but those of greater draft must lie near the mouth of the loch and open to the prevailing winds.

**Bowmore**, a village on the southeastern side of the loch, had a population of 805 in 1911. Ordinary supplies can be obtained, and there is a small pier for discharging coal.

**The Rhinns of Islay.**—The southwestern peninsula of Islay is known as the Rhinns; and Oversay, which is about  $\frac{1}{4}$  mile in extent, lies less than 200 yards off its southwestern extremity.

**Light.**—A flashing white light, 150 feet (45.7 m.) above water, visible 18 miles, is shown from a white tower, 96 feet (29.3 m.) high, on Oversay Island.

A fog signal is sounded at the lighthouse. See Light List.

Storm signals are exhibited at the light station, which is connected by telephone for life-saving purposes only.

**Coire Rock** ( $55^\circ 40' \text{ N.}, 6^\circ 31' \text{ W.}$ ),  $\frac{1}{4}$  mile south-southwestward from Oversay Lighthouse, dries at low water.

**Portnahaven.**—McKenzie Island is a little northward of Oversay, and within it is the small bight of Portnahaven, which affords shelter for a few large fishing boats.

**Frenchman Rocks** ( $55^\circ 42' \text{ N.}, 6^\circ 32' \text{ W.}$ ) extend 600 yards northwestward from Claddach Point, the northwestern point of the southwest coast of the Rhinns, and distant  $1\frac{1}{4}$  miles from Oversay Lighthouse. The outer rocks of the group are above water.

**Tidal currents.**—The northwest-going current passes Maol na Ho and crosses the mouth of Loch Indail in the shape of a bow,

convex part inwards, toward Oversay at a rate of 5 knots at springs during the rising tide, and causes races and overfalls all along the coast of the Ho, which are dangerous when opposed by northwesterly gales. The southeast-going current passes Oversay, crosses the mouth of Loch Indail in a bow at a rate of 3 knots at springs, and strikes the western side of the Ho; then, uniting with the main current, runs at a rate of 4 knots at springs during the falling tide, also producing races and overfalls off Maol na Ho. The rate of the currents off Maol na Ho decreases as the distance offshore increases.

At the head of Loch Indail the tidal current is not perceptible.

The tidal currents run with a rate reaching 8 knots at springs close inshore near Oversay and produce dangerous overfalls and races. The rate of the currents decreases as the distance offshore increases, and 5 miles southwestward of the island the rate is from  $2\frac{1}{2}$  to 3 knots. The current runs in a general south-southeast direction during the falling and in a general north-northwest direction during the rising tide.

**Detached banks.**—The bottom is very uneven between Islay and the north coast of Ireland. About  $6\frac{1}{2}$  miles,  $240^\circ$ , from Oversay Lighthouse is the eastern end of a bank  $1\frac{1}{4}$  miles in length, with depths of from 17 to 20 fathoms (31.1 to 36.6 m.) and 50 fathoms (91.4 m.) around, except toward the Rhinnis, where there are depths of from 29 to 15 fathoms (53 to 27.4 m.).

A patch about  $2\frac{1}{2}$  miles in length north and south with 16 to 19 fathoms (29.3 to 34.8 m.) lies 11 miles westward from Oversay Lighthouse. It has not yet been thoroughly examined.

A small patch with 19 fathoms (34.8 m.) lies 11 miles south-southwestward from the lighthouse; and Middle Bank, which is several detached patches in an area 2 miles long and  $1\frac{1}{2}$  miles wide, with depths of from 15 to 20 fathoms (27.4 to 36.6 m.) and closely surrounded by depths of from 20 to 70 fathoms (36.6 to 128 m.), lies about 8 miles south-southwestward from Maol na Ho.

Shamrock Knoll is nearly  $1\frac{1}{2}$  miles in extent, with depths of 16 to 29 fathoms (29.3 to 53 m.), but at its western end a 9-fathom (16.5 m.) pinnacle rises very steeply from a depth of 60 fathoms (109.7 m.). The pinnacle lies  $5\frac{1}{4}$  miles,  $310^\circ$ , from Bull Point, the western end of Rathlin Island.

Over these banks there are heavy overfalls in unsettled weather.

**West Bank.**—The 20-fathom (36.6 m.) curve of soundings passes  $\frac{1}{2}$  mile southward of Oversay, and continues westward for  $3\frac{1}{2}$  miles, when it turns to the northward. West Bank, about 3 miles northwestward from Claddach Point, is a narrow ridge 1 mile in length, northwest and southeast, with 7 fathoms (12.8 m.) water.

**Caution—Mines.**—Owing to sunken mines, vessels are recommended not to anchor except in an emergency nor to trawl without using some safety device to prevent mines entering the trawl, in an area, in the northwestern approach to North Channel, bounded by lines joining the following positions:

- (a) Latitude  $55^{\circ} 26' 10''$  N., longitude  $6^{\circ} 56' 30''$  W.
- (b) Latitude  $55^{\circ} 35' 20''$  N., longitude  $6^{\circ} 43' 15''$  W.
- (c) Latitude  $55^{\circ} 32' 40''$  N., longitude  $6^{\circ} 37' 45''$  W.
- (d) Latitude  $55^{\circ} 27' 30''$  N., longitude  $6^{\circ} 45' 00''$  W.
- (e) Latitude  $55^{\circ} 24' 50''$  N., longitude  $6^{\circ} 53' 45''$  W.

The northwest coast of Islay from Claddach Point trends northeastward for  $9\frac{3}{4}$  miles to Sanaig Point, the sharp and salient northwestern extremity of the island. Cul Point, 6 miles north-northeastward from Claddach Point, is the western extremity of a headland, and Darnaosda Rocks extend  $\frac{1}{4}$  mile southwestward from it. On the southern side of this headland is Machri Bay, which is open; on the northern side of the headland is Salicon Bay, also open.

**Tidal currents.**—The tidal currents off the northwest coast of Islay run northward during the rising and southward during the falling tide. The rate of the currents around Frenchman Rocks is 8 knots at springs and over West Bank 6 knots, but it gradually decreases to from 2 to  $2\frac{1}{2}$  knots off Sanaig Point. Close inshore there are eddies with the north-going current and there are races and overfalls over West Bank and near Frenchman Rocks. The eddy close inshore just northward of Frenchman Rocks runs southwestward during the whole of the north-going current, so that here is a constant set southwestward. There is also an eddy in Machri Bay during the north-going current as well as in Salicon Bay.

**Rocket apparatus.**—A rocket apparatus is kept at Kilchearan, west side of Islay, about 2 miles southward of Cul Point.

**Clachen Rocks** ( $55^{\circ} 51'$  N.,  $6^{\circ} 27'$  W.) extend 400 yards west-northwestward from Sanaig Point.

**Noamh Island.**—Ardnoamh is  $4\frac{3}{4}$  miles northeastward of Sanaig Point, and Noamh Island, 600 yards off its northern side, is  $\frac{3}{4}$  mile long, northeast and southwest, and a salient feature. A range of detached rocks and patches, of which Traisgidh Islets are the most conspicuous, runs southwestward parallel with the coast for nearly  $1\frac{1}{2}$  miles from the southwestern end of the island. The passage within the detached rocks and the island is rocky and foul. The northern coast of the island is foul to a distance of 400 yards, and a rocky reef extends about the same distance from its eastern end.

Anchorage may be obtained about 400 yards off the southeastern side of the island, with Ardnoamh in range with the low Kilanailean Point, in 3 fathoms (5.5 m.).

**Tides.**—It is high water, full and change, at Noamh Island at 5h. 2m.; springs rise  $11\frac{1}{2}$  feet, neaps 7 feet.

**Traigh Bhailanoais Bay**, situated between Ardnoamh and Gort an Toaid Points, is 2 miles wide in the entrance and 1 mile in depth to Kilanailean Point, the shore being lined by a sandy flat which extends nearly across the entrance to Loch Ghruinnard, leaving only a narrow channel on the western shore into the loch.

**Loch Ghruinnard** extends southward 3 miles from the southwestern angle of Traigh Bhailanoais Bay, but is shallow throughout.

**Balach Rocks**, a group nearly 1 mile in length, northeast and southwest, cover at springs. The nearest rock is 1 mile northeastward from Noamh Island; with a channel between. Bogha Chubaidh, southwestward of Oronsay, is nearly 4 miles northward from Balach Rocks.

The bluff of Sanaig Point, in range with the southern side of Noamh Island,  $237^\circ$ , leads southward of Balach Rocks, and Ben Fiteach, in range with Gort an Toaid Farm,  $131^\circ$ , leads between the island and the rocks.

**The coast** of Islay from Kilanailean Point ( $55^\circ 52' \text{ N.}$ ,  $6^\circ 19' \text{ W.}$ ) trends northeastward 5 miles to Bolsa Point, and it then turns eastward  $2\frac{1}{2}$  miles to Rudha Mhail, the northern extremity of the island and the western point of the northern entrance to the Sound of Islay.

**Post rocks** consist of a cluster of dark rough rocks lying about  $\frac{1}{2}$  mile from the north coast of Islay and about  $1\frac{1}{2}$  miles westward of Rudha Mhail. The group is about 300 yards in length and breadth and is all covered at high-water springs, excepting a small portion at the northern end, which is 1 foot (0.3 m.) above high water, but the greater part is visible at half tide.

Foul ground, with kelp, surrounds the group, which is steep to on the northern side and should not therefore be approached in thick weather, as the lead gives little or no warning.

**Clearing marks.**—Ben an Oir, the northern pap on Jura, open northward of Rudha Mhail Lighthouse, bearing  $119^\circ$ , leads northeastward of Post Rocks, and the bluff of Sanaig Point in range with the southern extremity of Noamh (Nave) Island,  $237^\circ$ , leads northward of them.

The coast abreast Post Rocks is foul for about 600 yards off.

**Light.**—A fixed white light, with red sector, 147 feet (44.8 m.) above water, visible 18 miles, is shown from a white tower, 113 feet (34.4 m.) high, on Rudha Mhail. The lighthouse shows up very distinctly against the dark background of heather-covered slopes. It is connected by telephone with Port Askaig post office.

**A rock** which dries 1 foot (0.3 m.) lies  $30^\circ$  about 180 yards from the lighthouse.

Patches of  $4\frac{3}{4}$  and 5 fathoms (8.7 and 9.1 m.) lie at distances of about 1,200 yards east-northeastward of Rudha Mhail, outside the 5-fathom (9.1 m.) curve, as charted. The southern patch of  $4\frac{3}{4}$  fathoms (8.7 m.) is over the dispersed wreck of the *Vivid* (1913).

A patch of  $4\frac{3}{4}$  fathoms (8.7 m.) about 200 yards in extent, lies at a distance of  $1\frac{1}{6}$  miles,  $47^\circ$ , from Rudha Mhail Lighthouse, coral bottom, with depths of  $6\frac{1}{4}$  fathoms around. The bottom is irregular in places between this patch and the lighthouse.

A patch of 10 fathoms (18.3 m.) lies 1.6 miles,  $2^\circ$ , from the lighthouse.

**Bagh an da Dhoruis** (Bay of Two Doors, taking its name from a large double-mouthed cave) has many detached rocks, the outermost bearing  $115^\circ$ , distant 1,050 yards from the highest part of Post Rocks. The bay is sandy in the center, but rocks fringe it on either side. The foreshore is cliffy, from 50 to 150 feet (15.2 to 45.7 m.) high, rising steeply to Ben Thrasda. From this bay to Rudha Mhail foul and rocky ground extends about 150 yards from the shore.

**Loch Tarbert** is situated on the west side of the northern approach to the Sound of Islay. Its entrance lies between Rudha Chrosigan (Chrois-doinidh) on the south, and Rudha an-t-Sailean, about  $1\frac{1}{4}$  miles apart in a northward and southward direction, from whence the loch gradually reduces in breadth toward the Narrows,  $2\frac{3}{4}$  miles up, at which point it is only about 200 yards wide, with shoals in the fairway. Above the Narrows it expands again, and the whole distance to its head (which is separated from Tarbert Bay on the east coast of Jura by an isthmus  $\frac{3}{4}$  mile across) is about 5 miles from the entrance.

**Depths—Anchorages.**—About  $1\frac{1}{2}$  miles of the outer part of the shores of the loch is available for anchorage of small vessels, but with the exception of Gleann Rìgh Beg, on the north side, and Glenpatrick Bay, on the south side, there is no shelter from westerly winds.

There is also anchorage toward the head of the loch, about 1,000 yards above Eilean Cumhann Mor, in from 5 to 6 fathoms (9.1 to 11 m.), but this should not be attempted without local knowledge.

In the fairway of the loch the depths are about 9 fathoms (16.5 m.), over sand, which would afford anchorage for large vessels during offshore winds. There is no indraft.

**Outlying dangers.**—Approaching and entering the loch from the northward, there is a patch of  $1\frac{1}{2}$  fathoms (2.7 m.) known as Bo Mor, situated  $210^\circ$ , distant 750 yards from Rudha an-t-Sailean, and about 1,600 yards westward of the Gleann Rìgh Islets off the northern shore of the loch.

Foul ground extends 150 yards northward of it, and a patch of  $4\frac{1}{2}$  fathoms (8.2 m.), with from 6 to 7 fathoms (11 to 12.8 m.) around, lies 200 yards south-southwestward of it.

Patches of 2 and  $2\frac{3}{4}$  fathoms (3.7 and 5 m.) lie 500 yards west-northwest of the Gleann Rìgh Islets, with others between them and those islets.

**Clearing marks.**—The southern extremity of Aird Reamhar, the western extremity of Gleann Rìgh Beg well open southward of Gleann Rìgh Islets, bearing  $91^\circ$ , or east-northeastward of that bearing, leads southward of these dangers, and the fall of Conoc Loch a Mhìle well open westward of Rudha an-t-Sailean bearing eastward of  $31^\circ$  leads westward of them, but the mark is said to be rather vague.

**Southern shore—Sgeir Agleann** ( $55^\circ 57' N.$ ,  $5^\circ 59' W.$ ).—From Rudha Chrosigan (Chrois-doinidh), which is foul only to a short distance, the coast trends eastward, forming two bays, off the eastern of which is Sgeir Agleann, consisting of a number of reefs dry at low water, and extending about  $\frac{1}{2}$  mile off the southern shore on a north-northeast line of bearing. The outermost drying rock dries 10 feet (3.1 m.), and is steep to on its northern side.

At about 300 yards  $22^\circ$  from the extremity of the highest drying rock, with a depth of nearly 4 fathoms (7.3 m.) between, is a rock with 4 feet (1.2 m.) water.

The fairway of the loch, about 1,000 yards wide, lies between the sunken rock and the Gleann Rìgh Islets, with depths of  $6\frac{1}{2}$  to 10 fathoms (11.9 to 18.3 m.).

**Glenbatrick Bay** lies between Sgeir Agleann and the prominent point eastward of it and affords sheltered anchorage in 6 to 7 fathoms (11 to 12.8 m.), over sandy bottom, with 250 yards swinging room, with Sgeir Agleann, highest rock (when above water), bearing  $255^\circ$ , distant 1,200 yards. This is the most sheltered anchorage in the loch, as it is more sheltered from the prevailing southwesterly winds than the anchorages of the northern shore, but the latter are to be preferred during northerly winds.

The shore abreast is sandy and dries out to the southernmost rock of Sgeir Agleann.

There is a shooting lodge at the back of the bay, at the foot of the glen, which trends thence to Paps of Jura. There is a small pier available for boats at high water.

From the eastern point of Glenbatrick Bay the coast trends eastward to Cumhann Mor, the Narrows, a distance of about 1 mile, but it should be given a wide berth, the clear channel being near the northern shore.

**Sgeir nam brutha daìen (Sgeirean a Bhudragain)** is a rocky islet, about 10 feet (3.1 m.) high, about 1 mile eastward of

Sgeir Agleann, and is surrounded by reefs to a distance of 150 yards. There are several other rocks within the 3-fathom (5.5 m.) curve between this and the Narrows. The shore within these rocks is a shallow bight with a stony high-water line and sand at low water.

**Rudha an-t-Sailean** (pronounced Ruantlen), the northwestern point of entrance to Loch Tarbert, is a rocky headland, 71 feet (21.6 m.) high, marked by a cairn and fairly conspicuous. The eastern face is grassy, but the western is bare, dark cliffs. There is good landing in a small rock-sided cove on its eastern side, and also in the sandy bight to the eastward.

**Caution.**—The bay between Rudha an-t-Sailean and the Gleann Rìgh Islets should be avoided, as frequently a heavy swell sets into it.

**Gleann Rìgh Islets** consist of a rocky cluster covered with grass and heather, 600 yards offshore, at about  $\frac{3}{4}$  mile southeastward of Rudha an-t-Sailean, the southernmost and highest being 16 feet (4.9 m.) high. There is no navigable channel between them and the northern shore. The shoals northwest of them have been mentioned.

**Gleann Rìgh Mor** is an indentation  $\frac{1}{2}$  mile eastward of the Gleann Rìgh Islets. It is easy of access and has good holding ground in about 6 fathoms (11 m.). The best anchorage is with Rudha an-t-Sailean bearing  $289^\circ$ , and the southern extremity of Gleann Rìgh Islets  $239^\circ$ , in 6 fathoms 11 m.). There is very little tidal current at this anchorage. Westerly gales send in a heavy sea, and anchorage should then be sought in Glenbatrick Bay.

**Aird Beamhar** is a bluff point, 10 feet (3.1 m.) high, separating Gleann Rìgh Mor from Gleann Rìgh Beg. It is apparently fairly steep-to.

**Gleann Rìgh Beg**, the next eastward, affords anchorage for small vessels, in about 5 fathoms (9.1 m.) excepting with winds from the westward.

**Rudha Liath** is the eastern extremity of Gleann Rìgh Beg. Rocks dry off to about 100 yards.

**Sgeirean an Rudha Liath** ( $55^\circ 58' N.$ ,  $5^\circ 57' W.$ ) is an islet about 10 feet (3.1 m.) high 160 yards northwestward of Rudha Liath. Rocks extend for 80 yards southwestward of the islet.

**Boglachan Baite** is a cluster of rocks, drying from 3 to 7 feet (0.9 to 2.1 m.) lying about 350 yards southward of Rudha Liath, the passage between being 150 yards wide, with depths of from 25 to 30 feet (7.6 to 9.1 m.). The channel separating them from the shoal water extending from the southern shore and Sgeirean a Bhudra-fain Rocks is about 150 yards wide, with depths of from 19 to 24 feet (5.8 to 7.3 m.).

Kelp surrounds all the above dangers.

**Northern shore.**—The northern shore of the loch, between the Rudha Liath and Narrows, consists of two bays with an islet 20 feet



(6.1 m.) high between. The shore is rugged and high, backed by steep slopes. In the western bay are a few drying rocks.

The channel through the loch, between the rocks off the islet and Sgeir nam brutha daien, is 130 yards wide, with depths of 14 to 32 feet (4.3 to 9.8 m.).

**Directions.**—From a position  $\frac{1}{2}$  mile southward of Bo Mor steer  $79^\circ$  for Aird Reamhar (the point separating Gleann Righ Mor from Gleann Righ Beg), and when eastward of Gleann Righ Islets, steer for either of the northern anchorages if the wind is from the northward or for Glenbatrick Bay if the wind is from the southwestward.

To proceed toward the Narrows, having passed Aird Reamhar, bring that point in range with the northern extremity of the larger of the two rocks, within Gleann Righ Islets, bearing  $291^\circ$ ; this leads between Rudha Liath and Boglachan Baite. After passing Rudha Liath keep to the northern shore, but pass in midchannel between Eilean Cumhann Mor and the southern shore, in about 3 fathoms (5.5 m.) water.

Small vessels with local knowledge only should attempt the Narrows.

**Tidal currents.**—In the bay westward of Gleann Righ Islets the current is variable; slack water may occur at any time, but chiefly between six hours after to four hours before high water at Dover (about the time of local high water). The average rate of the current is from  $\frac{1}{2}$  to  $\frac{3}{4}$  of a knot, and seldom exceeds  $1\frac{1}{4}$  knots.

From five hours before to two hours after high water at Dover the current sets northwest; its direction is then indefinite up to three hours after high water, but during the remainder of the Dover tide it sets generally in easterly and northerly directions.

At Gleann Righ Mor anchorage the tidal current is scarcely perceptible; any movement appears to be due chiefly to wind, especially when from a westerly direction, the rate rarely exceeding  $\frac{1}{4}$  knot.

**The Narrows.**—The western point of the Narrows of Loch Tarbert is named Rudha nam Meann, and the eastern Rudh' a' Choire, the space between being clear outside about 20 yards from the shore.

In the center of the Narrows is Eilean Cumhann Mor, 13 feet (4 m.) high; rocks extend for about 40 yards from the islet, narrowing the channel to about 40 yards, with depths of from 16 to 22 feet (4.9 to 6.7 m.).

An outlying rock, drying 5 feet (1.5 m.), lies 100 yards westward of the islet, making the channel so difficult that it ought not to be attempted by a stranger, especially as the tidal current runs strongly.

**Inner Loch Tarbert.**—Above the Narrows the Loch widens and deepens, the general direction being about north-northeast for about  $13\frac{1}{4}$  miles, and the greatest depth 23 fathoms (42.1 m.). There is

good anchorage out of the tidal current at 1,050 yards eastward of Cumhann Mor, as before mentioned, with the anchorages.

A rock, drying 1 foot (0.3 m.), lies at 1,350 yards eastward of the islet.

The southern shore consists of stony beaches and low cliffs, rising steeply to the moorland behind.

The upper Narrows, named Cumhann Beg, are 2,700 yards above Cumhann Mor. They are about 50 yards wide and 12 feet (3.7 m.) deep, and lead into another loch only available for light boats at high water. It is separated from Tarbert Bay, on the east coast of Jura, by an isthmus only  $\frac{3}{4}$  mile across.

**Sgeiraen Druimanloch**, near the head of the loch, is an off-lying rock, 1 foot (0.3 m.) high, situated 2,300 yards,  $74^\circ$ , from Eilean Cumhann Mor. Three drying rocks lie southeast of the rock, the outer being rather over 200 yards from it.

Northeastward of Sgeiraen Druimanloch there is a bight within which is a gamekeeper's cottage, with slate roof, and flagstaff. A stream of good water discharges into the loch close eastward of it. There is a small stone pier available for boats at high water, about 150 yards south-southwest of the flagstaff.

At 300 yards within, on the heathery slopes, is Cruibe Lodge, with a conspicuous red roof and yellow walls and verandas; it is only inhabited in the shooting season.

The northern shore of the upper loch is indented with shallow bights, the south sides of Eilean Ard and Eilean Dubh a' Chumhain Mor limiting the deeper water.

**Tarbert Bank**, the southwestern extremity of which is about  $2\frac{1}{4}$  miles northeastward of Rudha Mhail, extends northeastward for  $3\frac{1}{2}$  miles, with a width of 1 to  $1\frac{1}{4}$  miles inside the 10-fathom (18.3 m.) curve. Toward the northern part there are several ridges, with 40 feet (12.2 m.) or less, the least depth, 34 feet (10.4 m.), being situated  $2\frac{3}{4}$  miles,  $328^\circ$ , from Rudha an-t-Sailean. The bottom is smooth, hard, and covered with sand and broken shells.

**Tidal currents.**—The direction of the current at the south end of Tarbert Bank changes regularly, clockwise, round the compass, and there is no slack water, nor is there much difference in the rate at springs and neaps. The greatest rate, 2 knots, occurs at from 3 to 4 hours after high water at Dover, setting then to the northeastward; the least, 1 to  $1\frac{1}{4}$  knots, at from 2 to 3 hours before high water at Dover, when it is setting to the southwestward.

From the third hour after to the third hour before high water the current sets between  $0^\circ$  and  $30^\circ$ , with a rate varying from  $\frac{3}{4}$  knot to  $1\frac{1}{2}$  knots. With no definite period of slack water, it then changes to from  $270^\circ$  to  $306^\circ$ , with a rate of from  $\frac{1}{2}$  to 1 knot. During the

latter period a set of about a knot to the southward or southeastward is sometimes experienced; the west-going current, being less strong than the other, is possibly diverted to this direction by local winds and weather.

The northwestern coast of Jura between Loch Tarbert and the northern point of the island is generally bold and steep-to. The coast northward of Rudha an-t-Sailean trends northward for 3 miles to Sian (Shian) Island, and is generally rock with moorland slopes above. Here there are a great many raised beaches, which appear as large gray patches against the heather, the highest being about 110 feet (33.5 m.) above high water.

The shore is foul to the 3-fathom (5.5 m.) curve, and should be approached by boats with caution.

**Sian (Shian) Bay**, 3 miles north-northeastward of Rudha ant Sailean, is small, shallow, and there are several rocks in it, and Glendebadel and Glengarrisdale Bays,  $6\frac{1}{2}$  miles and  $8\frac{1}{4}$  miles, respectively, northeastward of Sian Bay, are also small, but have moderate depths and are easily accessible as temporary anchorages. As, however, southerly gales almost invariably veer to the northward, no anchorage can be deemed safe if open in that direction.

It is much exposed, and a heavy swell frequently sets on to the shore. Landing can be effected in fine weather on the south side of a point 450 yards southward of Sian (Shian) Island.

**Tides.**—It is high water, full and change, in Glengarrisdale Bay at 5h. 17m.; springs rise 11 feet, neaps 8 feet.

**Bagh uamh nan Giall**, 1 mile northeastward of Glengarrisdale Bay, is about 200 yards across at its entrance, whence it falls back 150 yards to the southward, clear of rocks, and has from 3 to 2 fathoms (5.5 to 3.7 m.) water; about 1,800 yards farther northeastward is Glen Trosdale Bay, open to the northwest. Buige Rock, which covers at high water, lies 200 yards north-northwestward of the northern point of Glen Trosdale.

**Eilean More** ( $56^{\circ} 09' N.$ ,  $5^{\circ} 45' W.$ ), about 200 yards in extent and 97 feet (29.6 m.) high, is  $\frac{1}{4}$  mile northwestward of the northern point of Glen Trosdale Bay, with depths of from 11 to 18 fathoms (20.1 to 32.9 m.) in the fairway of the passage between. The island is steep-to all round, except on its northwestern side, where there is a sunken rock 200 yards distant.

**Tidal currents.**—At the anchorage off Sian (Shian) Island, from 3 hours after to 4 hours before high water at Dover, the current sets between  $20^{\circ}$  and  $50^{\circ}$ , with an average rate of half a knot. At other times it sets between south and southwest, with a rate of  $\frac{1}{4}$  to  $\frac{1}{2}$  knot, or occasionally 1 knot. There is sometimes a short period of slack water.

**Bagh nam Muc.**—The entrance to this bay, 600 yards eastward of the northern point of Glen Trosdale Bay, is nearly 400 yards wide, and the bay is about 800 yards deep, with 6 to 8 fathoms (11 to 14.6 m.) water, and clear of rocks, but there are rocky shoals off both entrance points; the bay, being open to the northward, is subject to a heavy swell.

A small islet lies 300 yards off the northeastern entrance point of Bagh nam Muc, and there are several rocks in the channel between.

**Tidal currents.**—The movement of the surface water on the northwest coast of Jura between the Sound of Islay and the Gulf of Corryvreckan is confined between the currents issuing from or passing into that sound and gulf. The rate of the currents does not exceed  $\frac{1}{2}$  knot at springs, and their direction is influenced by the wind.

**Colonsay and Oronsay.**—These islands lie  $4\frac{3}{4}$  miles northward of Islay and 7 miles northwestward of Jura; to the northward the Ross of Mull is  $8\frac{3}{4}$  miles distant.

Colonsay, 7 miles in length, with an average breadth of 2 miles, is separated from Oronsay, the southern island, by a narrow channel 150 yards wide at high water, which dries  $1\frac{1}{2}$  hours before low water, and covers 3 hours before high water. The two islands are together 9 miles in length, north-northeast and south-southwest, and there are numerous off-lying rocks and reefs.

Carn nan Eun (Colonsay Tower), 493 feet (150 m.) high, situated  $1\frac{3}{4}$  miles nearly from the northeastern end of Colonsay, is the highest part of that island. Ben Oronsay, the highest hill in Oronsay, is 306 feet (93.3 m.) high, and it is readily distinguished by its wedge-like appearance, the precipitous rise being on the western side, with a gentle slope toward the east.

A considerable portion of the soil is arable and well cultivated, the principal crops being potatoes and barley. Black cattle of a superior breed are raised in large numbers. A cod fishery is also carried on. In Colonsay are several fresh-water lakes. In Oronsay are the remains of an extensive monastery, the ruins of which are equal in interest to those of Iona and in as good a state of preservation. Near it is a beautiful and entire cross.

Communication between the northern coast of Oronsay and Garvara farm in Colonsay is carried on by carts across a sandy flat or strand.

**Population.**—The population of the two islands was 284 in 1921.

**Bogha Chubaidh** ( $55^{\circ} 59' N.$ ,  $6^{\circ} 18' W.$ ), which lies 1,800 yards southwestward from Eilean nan Ron, an island connected with the southwestern end of Oronsay, is the southwesternmost reef off these islands. It is a rocky patch  $\frac{1}{2}$  mile long west and east, within the

5-fathom (9.1 m.) curve, and has a least depth of 1 foot (0.3 m.). Ben an Oir, the north Pap of Jura, a little within Rudha Mhail, 116°, leads close southwestward of Bogha Chubaidth.

The eastern coast of Oronsay, for about 1 mile from the southwestern point, is low and rocky, with low-water spurs running out 200 yards.

**Caennriva**, a small islet, 16 feet (4.9 m.) high and surrounded by reefs, is the southwestern of a chain of islets and reefs over 1 mile in length, off the southern coast of Oronsay, the high-water rocks and low-water line making the group almost continuous. Caennriva is  $\frac{3}{4}$  mile southeastward of the southwestern point of Oronsay, and 700 yards southwestward of the islet is a small detached patch with  $2\frac{1}{4}$  fathoms (4.1 m.) water.

**Eilean Gartmeal** is the northeastern and largest of this group. The narrowest part of Caolas More, the channel between the group and Oronsay, is nearly 400 yards wide, with from 4 to 7 fathoms (7.3 to 12.8 m.) water.

Northward of Eilean Gartmeal is a bay, terminating in Eilean Traighaidh, a low sandy point. The indentations of this irregularly shaped bay have sandy beaches terminating in rocky spurs and detached rocks. This bay is sometimes used as a temporary anchorage, the best position being in 4 to 5 fathoms (7.3 to 9.1 m.), between a boathouse on the low sandy shore and the northern end of Eilean Gartmeal.

There is also anchorage for small craft in from 2 to 3 fathoms (3.7 to 5.5 m.) in the northeastern bight of the bay and eastward of a rock which dries 1 foot (0.3 m.).

The coast from Eilean Traighaidh takes a gentle sweep to the northward, and at the distance of  $\frac{1}{2}$  mile is the narrow channel separating Oronsay from Colonsay. At 400 yards northeastward of Eilean Traighaidh is a detached rock which dries 3 feet (0.9 m.), and there is a rock with less than 6 feet (1.8 m.) water 300 yards farther northward.

The coast from the northern entrance point of the channel between the islands trends northeastward for about  $1\frac{1}{2}$  miles to the southern entrance point of Loch Sturrsneg, and there are several detached rocks and patches, 200 to 400 yards off it, northeastward to Eilean port a Chrochaidh, a distance of about  $\frac{3}{4}$  mile.

**Loch Sturrsneg**, a bay about 1,800 yards across at its entrance and  $\frac{1}{2}$  mile deep, affords anchorage in 6 to 7 fathoms (11 to 12.8 m.) sand, with Glassart Farmhouse just on with the southern point of Scalasaig Harbor, about 6°, during offshore winds.

**Light**.—A fixed white light, with red sector, 19 feet (5.8 m.) above water, visible 5 miles, is shown from a small tower on the headland southward of Scalassig Harbor.

**Beacon.**—A conspicuous stone obelisk stands on Cnoc na Faire, 800 yards westward of the light tower.

**Scalasaig Harbor** ( $56^{\circ} 04' N.$ ,  $6^{\circ} 11' W.$ ), a bight of small extent immediately northeastward of Loch Sturrsneg also affords shelter from offshore winds. The anchorage, in 4 fathoms (7.3 m.), about 300 yards outside the end of a pier, is only suitable for small vessels.

**Eilean Oloms** is a small islet close to the shore, about 1.3 miles from Scalasaig Harbor, the intervening coast being rocky but free from off-lying rocks. Small craft obtain temporary shelter from westerly winds close to the northward of the islet in about 3 fathoms (5.5 m.), and thence northeastward to Rudha Geodha, a distance of  $2\frac{1}{4}$  miles, the coast is steep-to at 100 yards.

**A patch** of 3 fathoms (5.5 m.) lies 200 yards offshore and about 1,670 yards,  $102^{\circ}$ , from Colonsay Tower.

**Rocky patch.**—A rocky patch of 7 fathoms (12.8 m.), with from 10 to 11 fathoms (18.3 to 20.1 m.) around, lies at a distance of 3,850 yards eastward of Scalasaig Lighthouse; depths of 10 fathoms (18.3 m.) extend a distance of  $\frac{1}{3}$  mile north-northeastward of the position, but the surrounding depths are not above 11 fathoms (20.1 m.).

**A patch** of 4 fathoms (7.3 m.) lies 300 yards offshore northward of Ballinahard Bay at a distance of 1,000 yards  $3^{\circ}$  from the hill over Rudha Geodha.

**A patch** of  $4\frac{1}{2}$  fathoms (8.2 m.) has been found at a distance of 3.1 miles,  $83^{\circ}$ , from Scalasaig Lighthouse. At 1,200 yards nearer the lighthouse is a shoal  $\frac{1}{2}$  mile in length, with depths of  $4\frac{1}{2}$  and  $5\frac{1}{2}$  fathoms (8.2 and 10.1 m.), rocky bottom. Both these shoals lie on a narrow bank  $1\frac{1}{4}$  miles long east and west, with depths of 7 to 9 fathoms (12.8 to 16.5 m.).

**Ballinahard Bay**, a gentle sweep of the coast immediately northward of Rudha Geodha, has a smooth sandy beach at its head and depths of 4 to 5 fathoms (7.3 to 9.1 m.) 200 yards from the shore. The coast between Rudha Geodha and Maol na Cala, the north-eastern end of Colonsay, a distance of 1,800 yards, is steep-to within 200 yards.

**Eilean Dubh**, 300 yards northward of Maol na Cala, is a small rock.

**The west coast** of Colonsay from Eilean Dubh trends southwestward  $1\frac{1}{2}$  miles to Killoran Bay, and is rugged and broken.

**Bogha enil na Sulair**, a detached narrow shoal 200 yards in length, with depths of 3 feet (0.9 m.) and deep water around, lies 350 yards offshore northward of Killoran Bay; between it and the northern end of Colonsay numerous detached rocks, with deep water close to them, extend along the coast within a distance of 400 yards.

**Killoran Bay** is open to the northward, and has depths of from 8 to 10 fathoms (14.6 to 18.3 m.), decreasing to 3 and 2 fathoms

(5.5 and 3.7 m.), but a very heavy sea is thrown into it during northerly gales. The head of the bay is a belt of fine sand, which covers the country inland for about 600 yards and renders tillage impracticable. Foul ground extends a considerable distance off the southwestern shore. A spur of rocks runs off 500 yards eastward from the western entrance point.

From Cille Rudha, a precipitous, cliffy point westward of Killoran Bay, the coast trends southwestward 2 miles, and presents a line of steep rocky cliffs rising over 400 feet (121.9 m.) in places at 200 yards inland.

**Bogha nan Stuadh** ( $56^{\circ} 05' N.$ ,  $6^{\circ} 16' W.$ ), a small off-lying rock which dries 6 feet (1.8 m.), is about  $2\frac{1}{4}$  miles southwestward of Cille Rudha and nearly 600 yards from the shore. Within it is a rock which also dries 6 feet (1.8 m.).

From this position south-southwestward along the coasts of Colonsay and Oronsay to Bogha Chubaidh there are numerous shoals and rocks, which extend in places nearly  $1\frac{3}{4}$  miles offshore.

**Tides and tidal currents.**—It is high water, full and change, at Scalasaig Harbor, Colonsay, at 5h. 18m.; springs rise 11 feet, neaps  $7\frac{1}{4}$  feet, neaps range  $3\frac{1}{2}$  feet.

The currents do not attain any great rate even during springs in the vicinity of Colonsay. The northgoing current, which sets along the western coast of Islay at a rate of 2 knots, turns northeastward off the western coast of Colonsay, where it has a rate of about 1 knot at springs. A branch of the northgoing current turns eastward between Islay and Oronsay and becomes lost in the broader channel between Colonsay and Jura, where for a considerable space there is no perceptible tidal current. Midway between Islay and Oronsay it is slack water about 3 hours before and 3 hours after high water.

The currents off Colonsay are somewhat irregular, and apparently influenced both in direction and speed by meteorological causes, but the results may be generally stated as follows:

When it is high water at Dover the current is setting between northwest and north, with an average rate of  $1\frac{1}{4}$  knots; it gradually shifts to the eastward until it is running east at 6 hours after high water at about the same rate. While the tide is rising at Dover, or falling locally, the current continues to alter its direction clockwise, from east, through south, to northwest, at first with a rate of  $\frac{1}{2}$  knot increasing to  $1\frac{1}{4}$  knots when northward of west.

The above is only a general statement, for slack water, or slight currents in contrary directions, occur not infrequently, and more particularly from 3 hours before to 2 hours after high water at Dover.

**The coast** of the mainland from Craignish Point to Ashnish Point, at the entrance to Loch Melfort, a distance of  $6\frac{1}{2}$  miles,

trends northeastward, but is much broken by small bays and indentations, and there are many rocky shoals and islets more or less adjacent to it. Farther offshore, and fronting the whole of this coast, as well as the entrance to Loch Melfort, and 5 miles beyond it to the northward, are the islands of Shuna, Luing, Scarba, the Isles of the Sea, and many smaller ones, with immediately northward of Luing the island of Seil, only separated from the mainland by the narrow passages Seil Sound and Clachan Sound. The outer sides of these islands form the southern side of the entrance to the Firth of Lorn, of which the southeastern coast of the Isle of Mull, 4 miles distant from Seil Island, forms the northern shore.

**Little Loch Craignish.**—The entrance to this narrow indentation lies 1 mile northeastward of Craignish Point and is fronted at the distance of 1,200 yards by the Isle of Ris an Vic Faden. The entrance is 100 yards across, and within there is a depth of 1 fathom (1.8 m.), but for very small craft the place is secure. A 2-foot (0.6 m.) patch lies westward of the northern point of the loch. At the head of Little Loch Craignish is Craignish Castle. There is a ferry between this loch and Kinuachdrach Bay, at the northeastern end of Jura. The ferryhouse is on the southern side of the entrance to Little Loch Craignish.

**Pier—Light.**—There is a pier, 130 feet long, on the southeastern shore of the approach to Little Loch Craignish, about 400 yards outside the entrance. A red fixed light is exhibited at the pier ( $56^{\circ} 09' N.$ ,  $5^{\circ} 36' W.$ ) when steamers are expected.

**Ris an Vic Faden**, the largest of a group of islands and rocks, 1,700 yards northward of Craignish Point, is  $\frac{1}{2}$  mile long north and south, about 250 yards broad, and surrounded by numerous rocks and shoals.

Coor Easar, an islet 400 yards long, lies 100 yards southwestward of Ris an Vic Faden. Foul ground extends 250 yards northward of Ris an Vic Faden, and near its outer end are a rock with 3 feet (0.9 m.) water, a rock which dries 2 feet (0.6 m.), and a rocky patch. A detached rock with  $1\frac{1}{2}$  fathoms (2.7 m.) water lies 200 yards off the eastern coast of Ris an Vic Faden, and 150 yards southward of it is a detached rock with  $2\frac{1}{2}$  fathoms (4.6 m.) water.

**Two-Foot Rock**, small and detached, with deep water around, lies  $144^{\circ}$  distant 400 yards from the southern end of Coor Easar, leaving a clear passage nearly  $\frac{1}{2}$  mile wide between it and the land north-northeastward of Craignish Point.

Shuna Cottage (white), in range with the eastern high-watermark of Ris an Vic Faden,  $2^{\circ}$ , leads 300 yards eastward of the rock; and Crinan Inn, a white building, in sight and just open north-north-



eastward of Garraeasar Island,  $139^{\circ}$ , leads the same distance westward of it.

**McIsaac Rock**, 800 yards  $318^{\circ}$  from the northeastern point of Ris an Vic Faden, is an isolated patch with  $1\frac{1}{4}$  fathoms (2.3 m.) water.

**Dearg Sgeir** (Red Rock),  $\frac{1}{4}$  mile westward of Ris an Vic Faden, dries 6 feet (1.8 m.). A rock with 2 feet (0.6 m.) water lies nearly 200 yards north-northeastward of it, and a rock with  $1\frac{3}{4}$  fathoms (3.2 m.) water 100 yards to the southeastward. The channel between these rocks and Ris an Vic Faden is deep and clear.

Degnish Hill,  $3^{\circ}$ , open northwestward of Shuna Mid Farm,  $16^{\circ}$ , leads northwestward of Dearg Sgeir and McIsaac Rock. Craignish Ferryhouse in range with the northern entrance point to Little Loch Craignish,  $134^{\circ}$ , leads east-northeastward of McIsaac Rock.

**Black Rocks**.—About 1,200 yards north-northwestward of the entrance to Little Loch Craignish is the southwestern of two islets connected with each other and joined to the mainland at low water. This islet is a salient feature of the coast; and Black Rocks, which cover at springs, extend 400 yards southwestward from it. The coast is foul between Little Loch Craignish and Black Rocks.

**Hutcheson Rock** ( $56^{\circ} 10' N.$ ,  $5^{\circ} 37' W.$ ), a pinnacle with  $1\frac{1}{2}$  fathoms (2.7 m.) water and depths of from 7 to 17 fathoms (12.8 to 31.1 m.) at the distance of 200 yards around, lies  $272^{\circ}$ , distant 1,400 yards from Drumach na Nearna, a somewhat remarkable hill, 213 feet (64.9 m.) high, on the adjoining mainland, with a rocky face close to the coast. The rock is  $\frac{1}{2}$  mile distant from the nearest shore, and the water is deep in the channel between.

Airds Farm open westward of the northern point of Little Loch Craignish,  $151^{\circ}$ , or North Fullah Island open west-southwestward of Ardluing Point,  $331^{\circ}$ , leads westward of the rock, and the southeastern extremity of Ris an Tru in range with the northwestern extremity of Ris an Vic Faden,  $208^{\circ}$ , leads southeastward of it.

**Barachan Bay** is a small indentation in the mainland about  $1\frac{1}{2}$  miles northward of Little Loch Craignish and immediately northward of Drumach na Nearna. The bay is clear, with depths of from  $4\frac{1}{2}$  to 1 fathom (8.2 to 1.8 m.) water, but open to the westward.

**Callivag Rock**,  $1\frac{1}{4}$  miles northward of Barachan Bay, dries 3 feet (0.9 m.), and is one of a detached rock shoal 250 yards in extent lying 400 yards offshore. Melfort Cottage in range with Ashnish Point,  $10^{\circ}$ , leads westward of the rock.

There is a 4-fathom (7.3 m.) patch 800 yards northward of Callivag Rock.

**Leath Rock**, the southernmost of a cluster of small islands, is 300 yards long north and south, and lies 1,600 yards northward of Callivag Rock. A ledge extends southward nearly 200 yards from

Leath Rock, and the southwestern rock of the ledge has a depth of 1 foot (0.3 m.)

**Arsa Island**, 500 yards long north and south and 400 yards broad, lies 200 yards northward of Leath Rock and  $\frac{1}{2}$  mile eastward from Shuna Island. Craobh Island is 200 yards north-northeastward of Arsa. A rocky ledge extends nearly 100 yards south-southwestward from Craobh Island, and there is a channel with 7 fathoms (12.8 m.) water close to Arsa.

**Camus Arsa** is a bight southeastward of and sheltered by these islands. It is 250 yards wide at the entrance, has from 2 to 5 fathoms (3.7 to 9.1 m.) water, and affords snug anchorage for small vessels with winds from north, through east, to south.

**Craobh and Dun Islands**, which lie close to the mainland northward of Camus Arsa, are practically one island, being connected at low water. Between the southeastern extremity of Craobh Island and the mainland is a passage about 70 yards wide, with  $11\frac{1}{4}$  fathoms (2.3 m.) water, leading into a small, well-sheltered anchorage in about  $31\frac{1}{2}$  fathoms (6.4 m.), good holding ground, southeastward of Dun Island.

**Buidhe Island**, 300 yards long, lies close to the shore and about 200 yards eastward of Dun Island, the passage between the islands being the northern entrance to the anchorage above mentioned. A rock with 1 fathom (1.8 m.) water lies nearly in mid-channel; to avoid it keep close to Dun Island.

The ground is foul and rocky for 400 yards northeastward of Buidhe Island, and 550 yards northward of the island is the western rock, with less than 6 feet (1.8 m.) water, of a patch extending northeastward 300 yards. The northern rock of this patch dries 3 feet (0.9 m.) and is 600 yards from the mainland, just northward of Barach a Bean Bay, with from 5 to 8 fathoms (9.1 to 14.6 m.) water between.

**Craigach Island** ( $56^{\circ} 13' N.$ ,  $5^{\circ} 34' W.$ ), with the rocks off each end, extends 800 yards north and south. The island is narrow and steep-to on all sides, excepting a small rocky reef which runs off 100 yards from its northern rock. From its northern rock Ashnish Point bears  $13^{\circ}$ , distant 1,400 yards.

**Ashnish Bay** lies southward of Ashnish Point, and affords shelter with winds from northward, through east, to southwest. Eich Donna Rocks, a ledge, extend 400 yards off the western point of the bay toward Craigach Island, and dry 2 feet (0.6 m.) in places. The apex of Dun Island in range with Lunga House,  $167^{\circ}$ , leads westward of the rocks.

**Loch Melfort**, chiefly frequented by vessels in connection with the powder works at Melfort, at the head of the loch, trends eastward 3

miles from its entrance, nearly  $1\frac{1}{4}$  miles wide between Ashnish and Degnish Points, which are both steep-to.

**Depths.**—The water is generally deep in the loch, but the bottom is uneven. In and near the entrance the soundings vary from 7 to 30 fathoms (12.8 to 54.9 m.), and in the loch from 7 to 25 fathoms (12.8 to 45.7 m.).

**Anchorage.**—There is good holding ground near the shore in from 9 to 11 fathoms (16.5 to 20.1 m.) in Kilhoan Bay ( $56^{\circ} 15' N.$ ,  $5^{\circ} 33' W.$ ), on the northern side of the loch,  $1\frac{1}{4}$  miles within the entrance, but it is not suitable for anchorage during strong south-westerly winds.

The anchorage most frequented is in Loch Fearnach, at the head of Loch Melfort on the northern shore. Loch Fearnach is a commodious and clear bay, affording good anchorage in 6 to 7 fathoms (11 to 12.8 m.), with Ard an Stur in range with the western point of Craig-aol Bay.

Loch Na Keil runs in southeastward  $\frac{1}{2}$  mile, with a width of about 300 yards, on the southern side of the head of Loch Melfort. There is anchorage in from 4 to 3 fathoms (7.3 to 5.5 m.) in the outer part, but the inner part dries at low water for some distance from its head.

North Ashnish, Craig-aol, and Kames Bays, on the southern shore of Loch Melfort, afford shelter from southerly winds, especially Kames Bay, which is also sheltered from westerly winds.

**Eilean na Scoul**, about 150 yards in extent, lies  $\frac{1}{2}$  mile south-southwestward of Degnish Point, about the same distance northward of Shuna, and also eastward of Luing Island. A ledge extends southward 150 yards from Eilean na Scoul.

**Eilean na Gamhainn**, nearly circular and about 300 yards in diameter, lies 1,200 yards eastward from Eilean na Scoul and 700 yards northwestward from Ashnish Point, the channel on each side being clear.

Rocks extend about 200 yards from the southeastern side of the island.

**Campbell Rock**, a patch situated in mid-channel between Ard-nish Point and Eilean na Coultar, has  $1\frac{3}{4}$  fathoms (3.2 m.) water, and 10 fathoms (18.3 m.) at a distance of 100 yards around.

The northern point of Shuma, open northward of Gamhainn,  $236^{\circ}$  leads northward; the northern point of Shuna, in range with the southern end of Gamhainn,  $244^{\circ}$ , leads southward; the southeastern point of Shuna Island, just open northwestward of Ashnish Point,  $201^{\circ}$ , leads northwestward; and the farm, Kilhoan Bay, open eastward of Melfort Cottage,  $351^{\circ}$ , leads eastward of the rock.

**Eilean na Coultar**, 400 yards long north and south, and separated by a passage 100 yards wide from the northern shore of the loch,

forms the eastern side of Kilhoan Bay. A rocky spur extends 150 yards off its southern point, and about 300 yards eastward from the same point is a small detached rock which dries 2 feet (0.6 m.).

Sgeir Cailleach, always above water, lies about 800 yards east-southeastward of Eilean na Coultar and over 400 yards from the northern shore of the loch.

**The coast** from Degnish Point ( $56^{\circ} 15' \text{ N.}$ ,  $5^{\circ} 36' \text{ W.}$ ), on the northern side of the entrance to Loch Melfort, trends northeastward 2 miles to the entrance to Ardmaddy Bay. The southern portion of this coast is fronted by Torsa Island, between which and the mainland is a channel 600 yards wide, with depths of from 40 to 6 fathoms (73.2 to 11 m.), leading into Seil Sound.

**Seil Sound** extends northward about  $3\frac{1}{4}$  miles from Torsa Island. Its outer part is 1,300 yards wide, decreasing to  $\frac{1}{2}$  mile just below Ardmaddy Bay, and there are central depths of from 10 to 20 fathoms (18.3 to 36.6 m.) in the sound northeastward to the western point of this bay.

**Ardmaddy Bay**, on the southeastern shore of Seil Sound, is about 600 yards wide and nearly  $\frac{1}{2}$  mile in depth. On its southeastern side is a jetty with 7 feet (2.1 m.) at its head at high water; but from a little outside the jetty the low-water strand forms only a slight curve to the western point of the bay, the whole of the inner part being dry at low water and the outer part shoaling rapidly from 2 fathoms to 2 feet (3.7 to 0.6 m.).

A small rock, awash at low water, lies 150 yards southward from the northwestern point of the bay.

Seil Sound is navigable for a mile northward from Ardmaddy Bay, its width between the mainland and Seil Island and its shoals being, for that distance, from about 200 to 500 yards. Farther northward the width rapidly diminishes until the coasts of Seil Island and the mainland are only separated by a few yards and are connected at low water. About  $\frac{1}{2}$  mile from the northern entrance to this narrow channel the mainland and Seil Island are also connected by a bridge having a single arch with a span of 69 feet, the center of which is  $40\frac{1}{2}$  feet (12.3 m.) above the bed of the channel. From the bridge northward this narrow channel is named Clachan Sound. From a point 1 mile northward of the bridge the coast trends northeastward toward the entrance to Barnacaryn Bay, about  $1\frac{1}{4}$  miles distant.

**Shuna Island**, off the entrance to Loch Melfort, is 2 miles long northward and southward, 1,600 yards broad, and near its middle attains a height of 296 feet (90.2 m.). At Rudha an Aol ( $56^{\circ} 14' \text{ N.}$ ,  $5^{\circ} 36' \text{ W.}$ ), its northern extremity, is a small inlet  $\frac{1}{4}$  mile in depth, having good anchorage for small vessels in from 3 to 5 fathoms (5.5 to 9.1 m.), and affording shelter from southerly winds.

A rocky spur runs 150 yards off the eastern point of the inlet, and this is the most off-lying shoal along the coast of the island.

Shuna is separated from Luing Island, to the westward, by Shuna Sound, a navigable channel 800 yards wide in its narrow part.

**Tidal currents.**—The currents run past Little Loch Craignish at a rate of 4 to 5 knots at springs, but northward of Ris an Vic Faden their rate diminishes to  $1\frac{1}{2}$  to 2 knots through Shuna Sound, and in Loch Melfort the currents disappear. The north-going current runs from  $4\frac{1}{2}$  hours after high water to  $1\frac{1}{2}$  hours before the next high water, and the south-going from  $1\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water.

**Luing Island**, 5 miles long northward and southward, about 1 mile broad, at its northern end 299 feet (91.1 m.), and at its southern end 212 feet (64.6 m.) high, forms the eastern side of Scarba Sound, the usual channel for ships proceeding to and from the northward inside the islands of Scarpa and Lunga. Its northern end is separated from Seil Island by Cuan Sound, a narrow channel across which a ferry is established.

**Ardluing Point**, the southern extremity of Luing Island, is isolated at high water. It should not be approached within  $\frac{1}{4}$  mile, as numerous rocks, awash and sunken, extend off in some places nearly 400 yards.

**Buoy.**—A red conical buoy is moored in 4 fathoms (7.3 m.) westward of the western extremity of these rocks.

Ashnish Hill, in range with the southern end of Shuna Island,  $47^\circ$ , leads southward, and Fladda Lighthouse, open westward of Leaca Point,  $344^\circ$ , leads westward of these rocks.

**The eastern coast** of Luing Island from Ardluing Point trends northward  $3\frac{3}{4}$  miles to Torsa Island. On this coast are Ard Bay and Kilchattan Bay. Ard Bay is near the southern end of the island and is only suitable for boats. Kilchattan Bay,  $1\frac{3}{4}$  miles to the northward, affords good anchorage in from 4 to 6 fathoms (7.3 to 11 m.), sheltered except from southwesterly winds.

Ardnamer Bay, a small bight, lies between the northeastern part of Luing and the southwestern end of Torsa Island. It has  $1\frac{1}{4}$  fathoms (2.1 m.) water and a rock awash in its entrance.

**Torsa Island**, including the small Eilean Eaglais at its northern end, is 1 mile long, 800 yards broad, and is connected at low water by Torsa Beg with Luing Island, forming on its western side, between the two islands, a bay encumbered with rocks.

There is a small bay near the northern end of the eastern coast of Torsa Island which affords anchorage in 4 to 5 fathoms (7.3 to 9.1 m.). On the shore of the bay are the ruins of Dog Castle.

Reefs extend 550 yards northeastward from the northern end of Eilean Eaglais ( $56^\circ 16' N.$ ,  $5^\circ 37' W.$ ), and a rock with  $1\frac{1}{2}$  fathoms

(2.7 m.) is situated 350 yards from the point in that direction. Shuna North Farm, in range with the western side of Eilean na Scoul, 180°, leads eastward of the reefs.

The western coast of Luing Island from Ardluing northward to Eilean McKeiran, a distance of 3 miles, is moderately clear of off-lying shoals, but from the southern end of that island northward for  $1\frac{1}{4}$  miles numerous islands, high water and sunken rocks, render navigation very intricate and dangerous except for small vessels. The northwestern coast is again clear of shoals for nearly a mile between Black Harbor and Port Mary, a little creek 600 yards from the northern end of the island.

**Black Mill Bay**, nearly 2 miles northward of Ardluing and just southward of Leaca Point, is a small indentation affording good anchorage in  $2\frac{1}{2}$  to 6 fathoms (4.6 to 11 m.), with Leaca Point in range with the northern point of North Fullah Island, and a dyke at the head of the bay end on. There is a pier on the southern side of the bay at which the mail steamers between Oban and Glasgow call.

**Light.**—A fixed red light is shown from the head of the pier at an elevation of 16 feet (4.9 m.) when steamers are expected.

**Eilean McKeiran**, nearly 800 yards long, lies 1,600 yards northward of Leaca Point and 200 yards distant from Luing Island. On the western side of the island is a cluster of rocks. The outer and southwestern of these rocks, with 3 feet (0.9 m.) water, lies 300 yards offshore, and along the coast of the island within about 600 yards to the northward are Sgeir Fionag and Sgeir na Coushaig, and a small patch with less than 1 fathom (1.8 m.) water, all in line.

**Chuilleanach Rock**, 750 yards westward from the northern end of Luing Island, is the outer rock of a cluster of rocky patches extending off Port Mary; it dries 6 feet (1.8 m.).

The peak of Scarba Island in range with the northwestern side of Debh Sgeir, 203°, leads 200 yards northwestward of the rock, but Scarba Peak is often obscured by mist; Fladda Lighthouse in range with McPhaills Point, Lunga Island, 211°, leads about 300 yards northwestward of it.

For other shoals and rocks off the west coast of Luing see the chart.

**Scarba.**—The island of Scarba,  $2\frac{3}{4}$  miles long, eastward and westward, and 2 miles broad, is remarkable for the peculiar formation of its central peak ( $56^{\circ} 11' N.$ ,  $5^{\circ} 43' W.$ ), which rises in a pyramidal form to the height of 1,478 feet (450.5 m.). It is almost destitute of inhabitants, its population being 15 in 1911. Its south coast, bold and step-to, is the northern shore of the Gulf of Corryvreckan, and on its eastern side is Scarba Sound.

There are no harbors anywhere on the bleak and rugged coasts of Scarba, though sometimes temporary anchorage is obtained off the

east coast inshore of the strong offing tidal current. On the north-west coast is a bay, 1,200 yards wide at its entrance and 400 yards deep, with a moderate depth of water, but quite open to the north-westward. A rock lies 500 yards northward from the southwestern point of the bay, and a rock lies  $\frac{1}{4}$  mile farther northward and the same distance westward from the northwestern point; both rocks have less than 6 feet (1.8 m.) water, with deep water between and around. The north coast of Scarba eastward of the northern point of the bay is steep-to.

The coast between the northern end of Scarba and Rudha puill na Eala, the eastern point of the island, a distance of 1,400 yards southeastward, is clear, and thence to Rudha na Una ( $56^{\circ} 10' N.$ ,  $5^{\circ} 40' W.$ ), the southeastern point, it trends southward  $1\frac{1}{2}$  miles.

**Maoile Rock**, 150 yards offshore and 900 yards southward of Rudha puill na Eala, is the northern end of a cluster of rocks extending about 300 yards along the shore. Between them and Rudha puill na Eala the coast forms a slightly concave bend, clear and with good holding ground in from 6 to 10 fathoms (11 to 18.3 m.), where vessels lie sheltered from southwest, through west, to north winds.

**Six-Foot Rocks.**—About 800 yards southward of Maoile Rock and 200 yards offshore is a rocky head with 6 feet (1.8 m.) water, being the outer part of a cluster; 200 yards farther southward and 100 yards offshore is a rock with 6 feet (1.8 m.) water, and between this rock and Rudha na Una the coast is clear. The northern point of North Fullah Island open about  $3^{\circ}$  eastward of Rudha puill na Eala,  $348^{\circ}$ , leads eastward of the Six-Foot Rocks, but close to them.

**Scarba Sound.**—The northern end of Scarba is separated from Lunga Island by Bheallaich a choin Ghlais, and the east coasts of Scarba, Lunga, and Fullah Islands from the western side of Scarba Sound, which has an average width of about 1,700 yards between them and Luing Island.

The southern entrance to Scarba Sound is deep and clear, but its northern entrance is much encumbered by islands and shoals. Notwithstanding these shoals and the great rate of the tidal currents, this sound is the channel generally used by vessels proceeding northward or southward to or from Jura Sound.

**Tidal currents.**—The north-going current through Scarba Sound runs at a rate of  $2\frac{1}{2}$  to 3 knots, at its southern end, from  $4\frac{1}{2}$  hours after high water to  $1\frac{1}{2}$  hours before the next high water, but gradually increases in rate northward to a greatest rate of 7 knots eastward of Fladda Island. It runs southward at a rate of about 6 knots at springs from  $1\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water.

**The Gulf of Corryvreckan** (Cauldron of the Speckled Sea) ( $56^{\circ} 09' N.$ ,  $5^{\circ} 42' W.$ ) is the channel, noted for its turbulent

water, separating the islands of Jura and Scarba. It is about 1,200 yards wide at its narrowest part, and with the exception of the rock lying 200 yards northwestward of Eilean More, appears to be clear of shoals.

The gulf varies greatly in depth; there are soundings of 120, 105, and 50 fathoms (219.5, 192, and 91.4 m.) in places, and in one place off the small bay of Bagh Ban, on the coast of Scarba, there is a depth of 15 fathoms (27.4 m.), with 25 to 42 fathoms (45.7 to 76.8 m.) close around.

**Tidal currents.**—The tidal currents rush through the Gulf of Corryvreckan at a rate of  $8\frac{1}{2}$  knots at springs, causing overfalls and races, especially on the northern side of the channel. The west-going current from about  $\frac{1}{2}$  hour before until  $4\frac{1}{2}$  hours after high water till  $1\frac{1}{2}$  hours before the next high water, and the east or in-going current from about  $\frac{1}{2}$  hour before until  $4\frac{1}{2}$  hours after high water. When the current is running westward through the middle of the gulf counter currents, or eddies, set eastward on both sides of it, and contribute to the agitation of the water, which is so great as to cause a breaking sea, sometimes so violent as to be dangerous to small vessels, with a strong breeze or gale opposed to the current the violence of the waves is such that the whole channel has the appearance of a mass of breakers. On the Jura side the water is less turbulent than on the Scarba side. The westgoing current preserves its character with a gradually decreasing rate for some miles after emerging from the gulf, and sends back eddies toward Jura, on the south, and Scarba, on the north, from the races which mark its course to the westward. The eddy on the north side causes the current to run southeastward for 11 hours, or from 5 hours before until 6 hours after high water, from Rudha na Faoilaig close in-shore to Bagh Ban.

The east-going current through the gulf does not run with the great rapidity and violence of the west-going current, for it emerges into comparatively tranquil waters. The direction of the east-going current within the gulf is toward the channel between Ris an Tru and Correasar for Dorus More and the other channels between Garraeasar and Ruadh Rock, and also southwestward through Jura Sound.

It is seldom that the water is slack in the Gulf of Corryvreckan. In very fine weather the waters may be quiet at neaps for about an hour during the change from one current to the other, but at springs this interval does not exceed a quarter of an hour.

**Directions.**—The navigation of the Gulf of Corryvreckan is at times most hazardous, and no stranger would under any circumstances be justified in attempting it. When the currents are slack and the waters quiet in fine weather, the gulf might perhaps be



navigated with safety. If, however, a sailing vessel should be near the eastern entrance to the gulf, during the west-going current at springs, she will be carried through. Then secure the hatches and endeavor to pass through the middle of the gulf, and probably the current will take the vessel between the most violent breakers, which lie upon each side. If the vessel should be taken toward the coast of Jura, it is advisable to keep near it, so that the current may carry her past the small islet off the northeastern entrance point of Bagh nam Muc, and if the wind be favorable she may, with the assistance of the eddy, be able to shoot into that small bay, where the ground is clean and shelter good.

A vessel in the Sound of Jura, bound northward with the north-going current, should keep near Ris an Tru Island, when a moderate breeze will take her through Scarba Sound, and enable her to avoid being drawn into the Gulf of Corryvreckan.

**Bheallaich a choin Ghlais** ( $56^{\circ} 12' N.$ ,  $5^{\circ} 41' W.$ ), the channel between Lunga and Scarba Islands, is 200 yards across. It is sometimes called the Little Corryvreckan.

It is unadvisable to go through this channel, and it should not be attempted by a stranger. If necessary to go through it, the time of slack water is preferable, and it should be entered from the westward with the east-going current rather than from the eastward with the west-going current. Bheallaich Island, in the eastern part of the channel, is 200 yards long east and west, and narrow. The passages on both sides which are less than 100 yards in width, have depths of 4 fathoms (7.3 m.).

**Tidal currents.**—In Bheallaich a choin Ghlais the north-going current begins  $1\frac{1}{4}$  hours before low water and sets westward, and the south-going current begins  $1\frac{1}{4}$  hours before high water and sets eastward. The currents attain a rate of about 8 knots at springs, creating a strong race westward of the narrow passage with the west-going current.

**Lunga Island.**—The Islands of Lunga, and South and North Fullah, to the northward of Scarba, are connected at low water, and are together about 2 miles in length northward and southward, with a greatest breadth of 1,400 yards. Eagle Hill, in Lunga Island, is 315 feet (96 m.) high.

The eastern coasts of Lunga and Fullah Islands are clear and steep-to, but at 400 yards northward of Bheallaich Island rocks extend about 130 yards offshore. At 800 yards farther northward, off Puill a Charrain, a rocky cluster runs out nearly 300 yards. The northeastern extremity of North Fullah open eastward of Gambna, an islet close to the northeastern point of Lunga, leads east-northeastward of the cluster. At 150 yards southeastward from Gambna Islet and

200 yards from Lunga is a detached rock, with  $1\frac{3}{4}$  fathoms (3.2 m.) water.

**Two-and-a-Quarter-Fathom Rock** ( $56^{\circ} 14' N.$ ,  $5^{\circ} 41' W.$ ), in mid-channel between North Fullah and Eilean McKeiran, is distant 700 yards from North Fullah and 600 yards from Sgeir na Coushaig, the deeper water being between To-and-a-Quarter-Fathom Rock and Sgeir na Coushaig.

**Garbhstuaidh Island**, 350 yards southwestward from the western part of Lunga Island, is  $\frac{1}{4}$  mile long north and south and 90 feet (27.4 m.) high. In the passage between it and Lunga are several rocks, which narrow the channel, with 3 fathoms (5.5 m.) water, to 100 yards.

**Suaicean Rock** lies 500 yards northwestward from the western point of Lunga, and from it a ledge extends northwestward 350 yards, terminating in two rocks, which dry 1 and 3 feet (0.3 and 0.9 m.) respectively.

The northwestern side of Ormsay in range with the southeastern side of Liath Island,  $37^{\circ}$ , leads northwestward of the ledge.

**Slate Islands.**—**Beul nan Uamh**, 1,700 yards northward from North Fullah, is  $\frac{1}{4}$  mile long north and south and about 250 yards broad. A rocky spur extends about 70 yards off its southeastern end.

A cluster of rocks and shoal water extend 650 yards northward from the island. Near the northern end of the cluster is a rock with 3 feet (0.9 m.) water. Fladda Lighthouse in range with Leaca Point, Luing Island,  $164^{\circ}$ , leads eastward of the 3-foot (0.9 m.) rock.

**Fladda Island**, 600 yards southeastward from Beul nan Uamh, is 150 yards long northwest and southeast, 150 yards broad, and low. The water is deep at the distance of 200 yards around the island. A rocky spur extends off its northern side that distance.

The passage between Beul nan Uamh and Fladda has depths of 10 fathoms (18.3 m.) in the fairway, but there are depths of less than 5 fathoms (9.1 m.) for 200 yards off each island.

**Light.**—A fixed white light, with red sector, 42 feet (76.8 m.) above water, visible 11 miles, is shown from a white tower 42 feet (76.8 m.) high on the eastern end of Fladda Island.

**Anchorage.**—Vessels shipping slate anchor in 5 to 6 fathoms (9.1 to 11 m.) northeastward of Fladda Island, with the lighthouse bearing  $184^{\circ}$  and the southern end of Beul nan Uamh in range with the highest part of Dunchonel Island.

**Two-Fathom Rock** ( $56^{\circ} 15' N.$ ,  $5^{\circ} 40' W.$ ),  $53^{\circ}$ , distant  $\frac{1}{4}$  mile from Fladda Lighthouse, is small, with depths of 5 fathoms (9.1 m.) at 100 yards around.

**Dubh Sgeir**, 700 yards southeastward from Fladda Lighthouse, and the same distance northward from Eilean McKeiran, is small and above water. The passage between Fladda and this rock has

from 9 to 14 fathoms (16.5 to 25.6 m.) water, and is the usual channel taken by steamers and small sailing vessels.

**Light.**—A flashing white light, 22 feet (6.7 m.) above water, visible 9 miles, is shown from a white tank on a concrete base, 20 feet (6.1 m.) high, on the middle of Dubh Sgeir.

**Ormsay**, 1,100 yards southwestward from Fladda and 700 yards northward from North Fullah Island, is 200 yards in extent. There is a strong race during the northgoing current from North Fullah Island, close to the westward of Ormsay and thence northward for  $\frac{1}{2}$  mile.

**Rocks.**—A patch with  $1\frac{1}{4}$  fathoms (2.3 m.) least water lies nearly midway between Ormsay and Fladda.

A rock with 6 feet (1.8 m.) water lies nearly  $\frac{1}{2}$  mile southward from Fladda, and midway between this rock and the patch with  $1\frac{1}{4}$  fathoms (2.3 m.) water is a patch of  $2\frac{1}{2}$  fathoms (4.6 m.). A patch, with 2 fathoms (3.7 m.) water, is 200 yards southward from the rock with 6 feet (1.8 m.) water, and a patch with 2 fathoms (3.7 m.) water lies 550 yards eastward from the same rock.

The southeastern extremity of Scarba Island just open eastward of Rudha puill na Eala,  $175^\circ$ , leads close eastward of the rock with 6 feet (1.8 m.) water in a depth of  $2\frac{3}{4}$  fathoms (5 m.).

**Black Islands**, lying about  $\frac{1}{2}$  mile northwestward of Lunga and the same distance west-northwestward of the Fullah Islands, are two islands and an islet, separated by passages 100 yards wide, and extending 1,800 yards northward and southward. The central and largest island is 1,400 yards long northeast and southwest, and from its eastern end a patch of rocks extends northward nearly 300 yards.

**Sgeir na Saidh**, a detached reef 200 yards in extent, the middle part of which dries about at quarter ebb, lies 600 yards eastward from the northern end of the northern Black Island, and  $\frac{1}{2}$  mile westward from Ormsay. Southwestward of the reef and between it and the northern Black Island is a detached patch, which dries 1 foot (0.3 m.) 200 yards from the shore, with a passage between.

To pass between Ormsay and Sgeir na Saidh, borrow on Ormsay, which is steep-to.

**Bogha ant Sagart** ( $56^\circ 13' N.$ ,  $5^\circ 45' W.$ ), 1 mile southwestward from the western end of the largest Black Island, is a small rock which dries 1 foot (0.3 m.). The highest part of Seil Island in range with the western extremity of Black Island,  $39^\circ$ , leads close northwestward; the northern point of North Fullah Island in range with the southern end of Liath Islet,  $54^\circ$ , leads southeastward; and Ben More, in Mull, in range with the western extremity of Garvelloch Island,  $326^\circ$ , leads southwestward of the rock.

**Isles of the Sea** are Eileach an Naoimh, Coulie, Garvelloch, and Dunchonel, which extend northeast and southwest 3.4 miles in a line, with narrow channels between them. They lie west-northwest-

ward of Lunga and the Black Islands, leaving a channel 1 mile wide between.

**Eileach an Naoimh**, the western isle, is 1 mile in length and 247 feet (73.5 m.) high. There are the ruins of an ancient chapel with a burial ground near the landing place on its southeastern side. Several rocks fringe the southeastern coast of this island, but all the outer ones are above water.

**Light**.—A flashing white light, 69 feet (21 m.) above water, visible 12 miles, is shown from a low white tower on the southwestern point of Eileach an Naoimh.

**Coulie**, 700 yards northeastward from Eileach an Naoimh, is  $\frac{1}{2}$  mile long and 130 feet (39.6 m.) high. There are several rocks in the passage between it and Eileach an Naoimh and about 200 yards southeastward of the island.

**Garvelloch**, about 150 yards northeastward from Coulie, is 1.1 miles long, 800 yards broad, and 362 feet (110.3 m.) high near its northeastern end. Its coasts are almost steep-to, and there is a convenient landing place on its southern coast.

**Dunchonel**, the easternmost of the group, is 600 yards long northeast and southwest, and is separated from Garvelloch by a clear passage 150 yards wide. Its coasts are steep-to and there is a convenient landing place on its southern coast.

**Tighgeadh Islet**,  $1\frac{1}{2}$  miles northeastward from Dunchonel, and nearly 2 miles southwestward from Easdale Island is the southern of two small rocky islets close together and steep-to.

**Bogha Nuadh**, or Bono Rock, a detached rock with 4 feet (1.2 m.) water on two heads 100 yards apart, lies 1,800 yards eastward from Tighgeadh Islet.

**Buoy**.—A black can buoy is moored in 8 fathoms on the eastern side of Bogha Nuadh.

**Bogha Ghair**,  $62^\circ$ , distant 550 yards from Bogha Nuadh, with deep water between, is a small, detached pinnacle with 2 fathoms (3.7 m.) water. Sheep Islet, its own breadth open westward of Easdale Island,  $8^\circ$ , leads eastward, and Degnish (or Ardmaddy) Hill, open just northward of Cuan Inn,  $102^\circ$ , leads northward of this rock.

A patch of 4 fathoms (7.3 m.) lies 350 yards northwestward, and a patch of  $4\frac{1}{2}$  fathoms (8.2 m.) 650 yards northward, from Bogha Ghair. The bottom in the vicinity of Bogha Ghair and these patches is rocky and uneven.

Bogha Nuadh and Bogha Ghair, with the 4-fathom (7.3 m.) patch northwestward of the latter, are covered by the red sector of Fladda Light.

**Tidal currents**.—The currents in the area between the Isles of the Sea and Black Islands are greatly influenced by the currents running through the Gulf of Corryvreckan, Bheallaich a choin Ghlais, and Scarba Sound. An eddy runs southwestward between

the Isles of the Sea and Black Islands 3 hours after the commencement of the north-going current, consequently the current there runs southwestward for 9 hours, or from  $4\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water, and northeastward from  $4\frac{1}{2}$  hours after high water till  $4\frac{1}{2}$  hours before the next high water.

**Seil Island**, on the western side of Seil and Clachan Sounds, is of irregular shape, 4 miles in length north and south, with a greatest breadth of  $1\frac{3}{4}$  miles. Dunmore Hill ( $56^{\circ} 18' N.$ ,  $5^{\circ} 38' W.$ ), in the western part of the island, is 489 feet (149 m.) high. Rudha Breac, its southern end, is nearly 1 mile distant from the mainland and lies between the northeastern parts of Luing and Torsa Islands, Cuan Sound, the channel between being about 200 yards wide in its narrowest places.

**Tidal currents.**—In Cuan Sound the north-going current begins  $4\frac{1}{2}$  hours after high water and sets westward; the south-going current begins  $1\frac{1}{2}$  hours before high water and sets eastward. The currents attain a rate of 7 knots at springs.

**The west coast** of Seil Island from Rudha Breac trends northward 2 miles to the head of Easdale Bay, which is open to the southwestward, and Easdale Island lies off its northwestern point.

This coast from Cuan Sound to Easdale Bay is in many places foul and rocky for 300 yards off it.

**Sgeir na Faoileann**, a rock above water, 200 yards from the shore and 700 yards northward of the entrance to Cuan Sound, is surrounded by foul ground, which extends 300 yards south-southwestward from it. The eastern point of Easdale Island in line with Marquis Point,  $347^{\circ}$ , leads eastward of the shoal.

**Easdale Island**, 800 yards long north and south, with a general breadth of 400 yards, is separated from the western point of Seil Island by Easdale Sound. The island is low, but in the middle is a green hill, 135 feet (41.1 m.) high, surmounted by a flagstaff. A rocky spur of high-water rocks extends 100 yards from Rudha na Faoileann, the southwestern end of the island, the outer rock being distant 1 mile from Bogha Ghair. Easdale Island and Caolas, on the eastern shore of the sound, have long been celebrated for their slate quarries.

The population of Seil and Easdale Islands was 775 in 1911.

**Easdale Sound** is about 100 yards across, but rocks and banks extending from the shore contract the navigable channel to less than 100 feet at low water. There are depths of about 17 feet (5.2 m.) in the northern entrance, 12 feet (3.7 m.) in the southern entrance, and 10 to 20 feet (3.1 to 6.1 m.) in the sound.

**Rocks, buoys, and beacons.**—North Rock ( $56^{\circ} 18' N.$ ,  $5^{\circ} 39' W.$ ), in the northern entrance, has 2 feet (0.6 m.) water, and a black can buoy is moored on its northeastern side in 15 feet (4.6 m.). A 4-foot (1.2 m.) patch lies close westward of the rock.

Mid Rock lies about 100 yards southeastward of North Rock; it dries 2 feet (0.6 m.) and is marked by an iron pillar surmounted by a ball painted black. There is said to be no passage between this rock and Easdale Island, but there is a passage eastward of the rock.

An iron pillar surmounted by a ball, painted red, stands on the outer edge of the rocky ledges extending off the eastern shore of the sound abreast of Mid Rock.

South Rock, 100 yards within the southern entrance, dries 2 feet (0.6 m.), and is marked by a red beacon.

A mooring buoy is placed in the sound between Mid and South Rocks; it is available for vessels hauling into or out from Caolas Pier.

East Rock, which lies on the eastern side of the southern entrance, dries 1 foot (0.3 m.) and is marked by a red beacon.

A small patch, with 6 feet (1.8 m.) water, just outside the southern entrance and 100 yards off the coast of Easdale Island, is marked by a black can buoy ( $56^{\circ} 18' N.$ ,  $5^{\circ} 39' W.$ ).

**Tides and tidal currents.**—It is high water, full and change, in Easdale Sound at 5h. 10m.; springs rise 11 feet, but are much affected by the winds. Northward of Black Islands the currents along the west coast of Luing Island issuing from Scarba Sound run toward Easdale Bay and through Easdale Sound, uniting with the current from Cuan Sound at the north end of Luing Island. The current runs to the northward from  $4\frac{1}{2}$  hours after high water to  $1\frac{1}{2}$  hours before the next high water at a rate of  $2\frac{1}{2}$  to 3 knots at springs, and to the southward from  $1\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water at a similar or somewhat increased rate. The south-going current outside Easdale Island creates an overfall off its southwestern point and an eddy in Easdale Bay.

**Directions.**—The depths in Easdale Sound are reported to be greatly changed, and strangers should not enter without a pilot, whose services are always available, and by whom vessels are berthed, generally on the Easdale side, where they are out of the tidal streams. In addition to anchoring hawsers are laid out to the shore.

Mail steamers between Glasgow and Oban call here.

**The coast** of Seil Island from Marquis Point, the eastern point at the northern entrance to Easdale Sound, trends northeastward 2 miles to Ardencapie Point, the northern point of the island; it is but slightly indented and generally steep-to.

**Sheep Isle**,  $\frac{3}{4}$  mile long north-northeast and south-southwest, and about 300 yards broad, is 1,600 yards northwestward of Seil Island, Sheep Sound, a clear and deep channel lying between. The southwestern part of the isle is 241 feet (73.5 m.) high, and the coasts are steep-to, except to the northeastward, where there are several shoals within a distance of 300 yards.

Sheep Islet, a small rock, lies 200 yards southeastward of the northeastern part of the isle.

**Dubh Sgeir**, a small rock above water, lies 600 yards north-northeastward of Sheep Isle, and a detached cluster of rocks, dry at low water, lies 200 yards northeastward of the Sgeir.

A rock with  $1\frac{1}{2}$  fathoms (2.7 m.) water lies 400 yards westward, a rock with  $1\frac{3}{4}$  fathoms (3.2 m.) 400 yards west-northwestward, and a rock with  $2\frac{1}{4}$  fathoms (4.1 m.) 800 yards northward from Dubh Sgeir.

Tightheadh Islet open one point northwestward of Sheep Isle,  $205^\circ$ , leads northwestward; the same islet open southeastward of Sheep Islet,  $215^\circ$ , leads southeastward; and Ben More in range with the northern end of Eilean Dun,  $85^\circ$ , leads northward of Dubh Sgeir and the rocks northeastward of Sheep Isle.

**Tidal currents.**—In Sheep Sound the northeast-going current runs from  $4\frac{1}{2}$  hours after high water until  $1\frac{1}{2}$  hours before the next high water, and the southwest-going current from  $1\frac{1}{2}$  hours before until  $4\frac{1}{2}$  hours after high water. Both currents have a rate of  $1\frac{1}{2}$  knots at springs.

**Ardencaple Bay** ( $56^\circ 19' \text{ N.}$ ,  $5^\circ 36' \text{ W.}$ ) lies eastward of Arden-caple Point, between it and a cluster of islands and rocks, of which Eilean Dun, distant 1,800 yards from Arden-caple Point and 700 yards off the land of Nether Lorn, is the northernmost.

**Anchorage.**—The bay is not recommended as an anchorage except temporarily to await turn of tide. For this purpose anchor in 6 to 7 fathoms (11 to 12.8 m.), with Dubh Sgeir, northeastward of Sheep Island, just open of Arden-caple Point; and Carn Breugach, the highest part of Kerrera Island, in range with the northwestern side of Eilean Dun.

There is also an inner anchorage in 5 fathoms (9.1 m.) with Arden-caple Point just shut in by Ardfad Island, but it should not be used by a stranger.

**The coast** of Nether Lorn from a point eastward of Eilean Dun trends northeastward  $1\frac{1}{4}$  miles to the western entrance point to Bárnacaryn Bay, on the southern side of the approach to Loch Feochan. Ben More, a hill 634 feet (193.2 m.) high, with the Toad of Lorn, a remarkable excrescence on its northeastern shoulder, is situated about  $\frac{1}{4}$  mile within this coast.

**Eight-Foot Rock**, small, and with deep water close-to, lies 500 yards  $290^\circ$  from the western point of Barnacaryn Bay, and 300 yards from the shore. Arden-caple Point well open northward of Eilean Dun,  $230^\circ$ , leads northward of the rock. The same point in range with the northern side of Eilean Dun leads between the rock and the shore in from 5 to 7 fathoms (9.1 to 12.8 m.) water.

## CHAPTER IV

**ISLAND OF MULL, SOUTH COAST, FROM IONA TO THE SOUND OF MULL—FIRTH OF LORN—LOCH FEOCHAN—KERRERA ISLAND AND SOUND, OBAN—LOCH ETIVE—LISMORE ISLAND—LYNN OF LORN—LOCH CRERAN—LYNN OF MORVEN—LOCHS LINNHE AND ABER, CALEDONIAN CANAL, LOCH EIL, BALLACHULISH BAY, AND LOCH LEVEN**

**Mull**, one of the most important islands of the inner Hebrides, is separated from the mainland by the Firth of Lorn and Sound of Mull. The island is 26 miles long east and west, and 24 miles broad; it is deeply indented by several lochs, and near its middle, the head of Loch na Keal, on the western coast, is distant  $2\frac{1}{2}$  miles from the Sound of Mull on the eastern side of the island.

The island is mountainous, many of the mountains attaining a considerable height; Ben More, which rises to a conical summit 3,163 feet (964.1 m.) high, being the loftiest.

Tobermory is the only town, and with the village of Salen, is situated on the Sound of Mull; the village of Bunessan is situated at the head of Loch Lathaich.

The population of Mull was 5,003 in 1921. The inhabitants are employed in agriculture and grazing, the latter in the higher lands and mountainous districts.

**Ross of Mull.**—The coasts of the western portion of the Ross of Mull, which is the southwestern peninsula of the island, together with those of Iona, are fringed with numerous rocks, in addition to which there are extensively off-lying shoals.

**Caution.**—In thick or hazy weather great caution is necessary in approaching the Ross of Mull from the southwestward, the lead affording but little intimation of the vicinity of the reefs until very close to them.

**Dubh Artach** (Black Quarry or St. Johns Rock) ( $56^{\circ} 08' N.$ ,  $6^{\circ} 38' W.$ ) lies 16 miles westward of the northern point of Colonsay. It is about 250 feet long northwest and southeast, 140 feet broad, and 47 feet (14.3 m.) high. A group of rocks which dry extends 700 yards westward from it.

**Light.**—A group flashing white light on Dubh Artach, 145 feet (44.2 m.) above water, visible 18 miles, is shown from a gray granite tower, 126 feet (38.4 m.) high, with a red band, 30 feet wide, around its middle.



A fog signal is sounded at the lighthouse. See Light List.

**Tides and tidal currents.**—It is high water, full and change, at Dubh Artach at 5h. 9m., approximately.

The tidal current at Dubh Artach sets northward during the rising and to the southward during the falling tide. The rate of these currents is about  $1\frac{1}{2}$  knots at springs, but more over the rocks which uncover in its vicinity.

**Torranan Rocks** are a group of islets and rocks above and below water, extending 5 miles southwestward of the southwestern end of the Ross of Mull, with a breadth of  $2\frac{1}{2}$  miles in places. The rocks are more or less detached from each other, with deep water between.

The largest and highest islet of the group is situated  $230^{\circ}$   $2\frac{3}{4}$  miles from Eilean Chalman, an islet lying 700 yards off the southwestern coast of the Ross of Mull. It is 74 feet (22.6 m.) high, and is the middle one of three rocky islets which together extend 400 yards north and south. A rock, which dries 9 feet (2.7 m.) lies  $\frac{1}{4}$  mile northwestward of these three islets, and there are numerous rocks within a distance of 1,800 yards eastward from them.

**West Reef**, about 1 mile westward from the highest Torranan Rock, the channel between being clear and deep, is about  $\frac{3}{4}$  mile in extent. West Rock, the western rock of the reef, dries 11 feet (3.4 m.) and excepting at high-water springs, during unusually fine weather, always shows.

Three patches of from  $2\frac{1}{4}$  to  $2\frac{1}{2}$  fathoms (4.1 to 4.6 m.) extending 700 yards east and west, lie  $1\frac{1}{4}$  miles southward of West Rock. West Rock in range with the summit of Soay,  $3^{\circ}$ , leads westward of these patches.

**Frasiers Rock**, the northernmost of the group, is a pinnacle with 1 foot (0.3 m.) water, situated 2 miles  $169^{\circ}$  from the highest Torranan Rock.

**Otter Rock** ( $56^{\circ} 13' N.$ ,  $6^{\circ} 23' W.$ ) lies 1,700 yards  $54^{\circ}$  from Frasiere Rock, and there are numerous rocks in the space between these rocks and the highest Torranan Rock and the rocks eastward of it.

**Ruadh Sgeir**, the easternmost of the rocks above high water of the Torranan Group, is  $1\frac{1}{4}$  miles  $180^{\circ}$  from Eilean Chalman.

**Beacon.**—A stone beacon, surmounted by a cross, stands on Ruadh Sgeir.

There are patches of rocks within 600 yards southwestward of Ruadh Sgeir,  $\frac{3}{4}$  of a mile westward, and a patch of  $1\frac{1}{2}$  fathoms (2.7 m.) 600 yards northeastward of it.

**Dearg Sgeir** is one of several rocks lying within 1.2 miles northwestward of Ruadh Sgeir.

**Bogha nan Ramfhear**, a small rock which dries 4 feet (1.2 m.) at low water, is the inner rock of the group; it lies 1,400 yards south-

ward from Eilean Chalman, and about the same distance northeastward from Ruadh Sgeir. Caution is necessary to avoid it when taking the passage between the Torranan Rocks and the Ross of Mull, as there is no leading mark through.

**Bogha bhun a Chuoil**, a pinnacle with a depth of 6 feet (1.8 m.), surrounded by deep water, lies 1,400 yards 238° from Dubh Sgeir, off the western end of the Ross. Iona Cathedral Tower open northwestward of the Free Church, 15°, leads northwestward; the cathedral tower open southeastward of the Free Church, 9°, leads southeastward; the southern end of Eilean nam Muc in range with the northern end of Dubh Sgeir, 63°, leads northward; and the inner point of Maolmore open southward of Eilean Chalman, 97°, leads southward of the rock.

**Iona**, an island westward of the Ross of Mull, and separated from it by a channel varying from 1 mile to 1,200 yards in width, is 3 miles in length northeast and southwest, and about 1 mile broad; from the southward and westward it presents a barren aspect. The island is generally low, with an irregular outline formed by numerous knolls; of these Dun Ii, 327 feet (99.7 m.) high, near the northeastern end of the island, is the highest.

The population of the island was 222 in 1911.

The ruins of the cathedral, with its massive square tower, 70 feet (21.3 m.) high (56° 20' N., 6° 23' W.), on the eastern side of the island, are conspicuous. The village is near the cathedral; it has postal and telegraphic communication; mail steamers from Oban, via Tobermory and Bunessan call regularly.

**Boat slip.**—A boat-slip landing has been built near the southern end of the village, as charted.

The northwestern coast of the island is moderately high, with bold headlands; it is rugged and rocky, and should be given a wide berth, for though the locality, beyond 600 yards from the salient points, is believed to be clear, the nature of the bottom is such that there may be unknown rocks.

A cluster of many small rocky islets and rocks extends off the southern point of the island. Sgeir an Oir, the outer high-water rock, lies  $\frac{1}{2}$  mile 216° from the point, and foul ground, with  $2\frac{1}{2}$  fathoms (4.6 m.) water at its extremity, extends 300 yards southward from it. A rock, with 6 feet (1.8 m.) water, lies 700 yards 272° from Sgeir an Oir.

**Soay**, about 1 mile southwestward of Sgeir an Oir, is one of a group of several small islets. The highest and outer islet of the group is 115 feet (35.1 m.) high, and westward of it the ground is rocky and foul for over  $\frac{1}{2}$  a mile, a rock with 3 feet (0.9 m.) water bearing 251°, distant 800 yards, and a rock with  $1\frac{1}{2}$  fathoms

(2.7 m.) bearing  $255^\circ$ , distant 1,100 yards, from the southern end of the group, being the outer rocks.

**Druim Soay**, a rock which dries 7 feet (2.1 m.), is situated 700 yards northward from the northern point of Soay, and 200 yards to the northward of it is a  $2\frac{1}{2}$  fathom (4.6 m.) patch.

**Stac Mhicmhuirich**, the western and largest of several small islets lying close together northwestward  $1\frac{1}{4}$  miles from Corr Eilean, at the northwestern point of Iona, is 99 feet (30.2 m.) high, and its southwestern coast has a remarkable basaltic columnar formation. The islets of the group extend 700 yards eastward from Stac Mhicmhuirich. Reidh Eilean is the next largest of the islets.

A detached patch of sunken rocks lies from 600 to 950 yards northeastward of the group. About  $\frac{1}{4}$  mile eastward of the group is Bo an Reidh Eilean, a rock which dries 6 feet (1.8 m.); and 200 yards southward of Bo an Reidh Eilean is a rock with 2 feet (0.6 m.) water. A rock with less than 6 feet (1.8 m.) water lies 100 yards northeastward of the eastern islet. Two patches, with 5 fathoms (9.1 m.) of water, lie  $\frac{3}{4}$  mile,  $25^\circ$ , and 1,800 yards,  $15^\circ$ , from the eastern islet of the group.

The western extremity of Iona in range with the eastern extremity of Soay  $7^\circ$  leads eastward of these rocks.

**Five Fathom Rock**, with 5 fathoms (9.1 m.) of water, lies 2.4 miles  $295^\circ$  from the Soay Group; Iona Spit, with 8 fathoms (14.6 m.) of water, lies  $1\frac{1}{2}$  miles farther westward; and a patch with 7 fathoms (12.8 m.) lies  $3\frac{3}{4}$  miles west-northwestward from the northwestern end of the Soay Group.

**Bogha Reidh** ( $56^\circ 20' N.$ ,  $6^\circ 32' W.$ ) is a rocky shoal of 4 fathoms (7.3 m.), 2.2 miles southwestward of Stac Mhicmhuirich. A 5-fathom (9.1 m.) patch lies  $3\frac{1}{2}$  miles  $255^\circ$ , and a similar patch  $4\frac{1}{2}$  miles  $290^\circ$  from Bogha Reidh.

**The Sound of Iona** at its narrowest part between Liath Eilean and Iona is nearly 800 yards in width, but as a sand bank, with 3 feet (0.9 m.) least water, extends from Iona near the village almost across the channel, the sound is only available for vessels of light draft and should not be entered without a pilot. In summer it is much frequented by steamers from Oban.

On the eastern side of the northern part of the sound a group of small islands lies parallel with the coast of Mull for about  $\frac{3}{4}$  mile. The passage between these islands and the coast is in some places only 100 yards wide; but, entered from the southward, it affords a good anchorage for small vessels in Bull Hole, which is resorted to by vessels shipping granite from the adjacent quarries.

**Beacons.**—The entrance to Earraid Sound, which is situated on the coast of Mull near the southern entrance to the Sound of Iona, is marked by a beacon on either side.

**Bogha Choilta**, a rock with less than 6 feet (1.8 m.) of water, lies on the eastern side of the sound, 1.1 miles  $80^\circ$  from Rudha Charraigeire, the southern point of Iona.

**Buoy**.—A red conical buoy is moored on the western side of Bogha Choilta.

**Bo na Sliginach**, a rock with 3 feet (0.9 m.) of water, lies 1,550 yards  $19^\circ$  from Bogha Choilta, and about 100 and 300 yards north-northeastward of it are two patches with  $1\frac{1}{4}$  and  $1\frac{1}{2}$  fathoms (2.3 and 2.7 m.) water, respectively.

**Buoys**.—A red conical buoy is moored on the western side of the above-mentioned  $1\frac{1}{2}$ -fathom (2.7 m.) patch.

A spherical buoy, painted black and white in horizontal bands and surmounted by a staff and diamond, is moored southward of a rock with 6 feet (1.8 m.) of water situated at the southern end of the sand bank extending from Iona Village.

**Rock**.—A rock ( $56^\circ 20' N.$ ,  $6^\circ 23' W.$ ), with a depth of  $1\frac{1}{2}$  fathoms (2.7 m.), lies to the eastward of the village and to the northward of the sand bank.

**Directions**.—From the eastward when about 1 mile southward of Ardalanish Point, bring the northern end of the Soay Group half their own apparent breadth open southwestward of the rocks above water southwestward of Eilean Chalman,  $292^\circ$ ; keep this mark on, which leads in mid-channel between Bogha nan Ramfhear and the rocks off Eilean Chalman, and a little more than 200 yards southward of a 2-fathom (3.7 m.) rock situated 500 yards westward of Sgeir Calliach. When Dubh Sgeir, the outer high-water rock off Eilean nam Muc, is in range with Dun Ii,  $0^\circ$ , steer for Eilean na h aon Chaora, off the southern end of Iona, about  $323^\circ$ , to clear Bogha bhun a Chuoil, until the cathedral tower is in range with the Free Church,  $12^\circ$ , which mark leads westward of the rocks off the Ross of Mull and up the Sound of Iona for about  $\frac{1}{2}$  mile above Rudha Charriageire.

To pass outside Iona, proceed as above directed until the middle of Eilean Chalman bears  $4^\circ$ , when steer  $279^\circ$ , keeping the inner point of Maolmore open southward of Eilean Chalman,  $97^\circ$ , to clear Bogha bhun a Chuoil, and the inner point of Maolmore well open when approaching the southwestern end of Soay. When Stac Mhicmhuirich bears  $15^\circ$  steer for it until past Druim Soay, then alter course to pass either inside or outside the Stac Group.

To pass between Soay and the southern end of Iona, proceed as above directed until, when steering about  $323^\circ$  for Eilean na h aon Chaora, Dubh Sgeir is in range with the summit of Eilean Chalman,  $112^\circ$ . This mark astern leads through the passage, but close southward of a patch with  $4\frac{1}{4}$  fathoms (7.6 m.) water.

**Tides and tidal currents.**—It is high water, full and change, in the Sound of Iona at 5h. 11m.; springs rise  $11\frac{3}{4}$  feet, neaps  $8\frac{3}{4}$  feet; neaps range  $4\frac{1}{2}$  feet.

In the vicinity of Otter Rock the north-going current, setting from north-northeast to northwest, begins  $4\frac{1}{2}$  hours after high water, and the south-going current, setting from south-southwest to southeast, begins  $1\frac{3}{4}$  hours before high water. The rate of the currents is about 2 knots at springs.

About 2 miles westward of West Rock the northeast-going current begins at low water and the southwest-going current at high water. The rate of the currents is about 2 knots at springs.

In the vicinity of Bogha Reidh the northeast-going current begins at low water and the southwest-going current at high water. The rate of the currents is about  $1\frac{1}{2}$  knots at springs.

In the Sound of Iona the northeast-going current begins  $5\frac{1}{4}$  hours after high water, and the southwest-going current  $\frac{3}{4}$  hour before high water. The rate of the currents is about 2 knots at springs.

**West coast of Mull.**—For the coast of Mull eastward and northward of Iona, see next chapter.

**South coast of Mull.**—Maolmore, 1.4 miles east-southeastward of Eilean Chalman, is one of the numerous rocky islets off this coast. Ardalanish Point,  $2\frac{3}{4}$  miles east-southeastward of Eilean Chalman, is low and rocky, with several rocks above high water off it which are steep-to.

The coast between Ardalanish and Rudha nam Braithrean, a distance of  $4\frac{1}{2}$  miles to the eastward, is rugged, rocky, and falls back, forming Ardalanish Bay and several smaller indentations, which are unavailable for anchorages, as the bottom in any moderate depth of water is rock. Numerous rocks and islets lie near the shore, and some of the rocks extend off 500 yards about 2 miles eastward of Ardalanish.

The coast between Rudha nam Braithrean and Rudha Fhaoilean ( $56^{\circ} 17' N.$ ,  $6^{\circ} 03' W.$ ) recedes upward of 1,000 yards, forming a bay with rugged shores and basaltic cliffs, which may be approached to the distance of 200 yards, except in the bight on the northwestern side, where a detached rock, dry at low water, lies 400 yards off-shore.

The remarkable precipitous cliffs on this coast attain their greatest height at Rudha Fhaoilean, where they are 964 feet (293.8 m.) high at about 400 yards inland. The Carsaig arches, a remarkable natural formation, are situated at the base of these cliffs. The most curious is a pyramidal mass of rock rising to a great height, perforated through the middle by an unusual shaped arch, and surmounted by the solitary shaft of a basaltic pillar. In this locality the cliffs are

lined with basaltic columns, some of them attaining a diameter of 7 feet.

The coast from Rudha Fhaoilean to Rudha Dubh, the western point of the entrance to Loch Buy, a distance of  $4\frac{1}{2}$  miles to the eastward, is steep-to except where it falls back and forms Carsaig Bay, which is fronted and afforded some shelter by Eilean Gamnach. A rock lying 200 yards off Rudha Dubh dries 1 foot (0.3 m.).

**Carsaig Bay**, 3 miles eastward of Rudha Fhaoilean, is small and surrounded by high, precipitous hills. The bay is unsafe, except in the part sheltered by Eilean Gamnach, where small vessels can obtain anchorage.

The northeastern part of Carsaig Bay is rocky and foul from 200 to 400 yards offshore from abreast of the eastern end of Eilean Gamnach to the head of the bay. Three of the rocks are marked by perches to facilitate the approach to Carsaig Quay.

Steamers from Oban call daily during summer.

**Eilean Gamnach** is several rocks above high water, the highest being 9 feet (2.7 m.) high. At low water, when the rocks are connected, the island is 600 yards long; its eastern end is distant  $\frac{1}{4}$  mile from the shore eastward of Carsaig Bay, and is steep-to, but a cluster of rocks extends 200 yards westward from the island and terminates in a rock which dries 3 feet (0.9 m.), leaving a passage nearly  $\frac{1}{2}$  mile wide between it and the precipitous shore to the westward.

A rock, with  $1\frac{3}{4}$  fathoms (3.2 m.) of water, lies about 600 yards west-northwestward from the western end of Eilean Gamnach, but only 400 yards from the above-mentioned rock, which dries 3 feet (0.9 m.); between them are depths of from 2 to 5 fathoms (3.7 to 9.1 m.).

**Anchorage.**—There is anchorage suitable for small vessels northward of the middle part of Eilean Gamnach, in 4 fathoms (7.3 m.), and two rings have been fixed to the island for vessels to make fast their hawsers during bad weather.

**Tides and tidal currents.**—It is high water, full and change, at Carsaig Quay at 5h. 28m.; springs rise 10 feet, neaps  $7\frac{1}{4}$  feet; neaps range  $3\frac{3}{4}$  feet. The tidal currents between Colonsay and the Ross of Mull are very irregular, and have but little strength until near the Firth of Lorn, southward of Loch Buy. The currents along the south coast of Mull are weak westward of Carsaig Bay.

**Loch Buy**, the entrance to which is between Rudha Dubh ( $56^{\circ} 19' \text{ N.}, 5^{\circ} 56' \text{ W.}$ ) and Rudha na Faoileann,  $1\frac{1}{2}$  miles eastward, extends  $2\frac{1}{2}$  miles northeastward. The shores of the loch are rocky and steep-to, the land around being high, except a small area at the head of the loch. Eilean More, a small islet 13 feet (4 m.) high, is joined to the shore at the head of the loch by a neck of sand and boulders.

The low ground at the head of Loch Buy is wooded, and on it are the ruins of Moy Castle and the modern building of Loch Buy House. Ben Buy,  $1\frac{1}{4}$  miles northward from the head of the loch, is 2,352 feet (716.9 m.) high, and Creach Ben,  $2\frac{1}{4}$  miles north-eastward from the head of the loch, is 2,344 feet (714.4 m.) high, these mountains being divided by a deep ravine running north-east and southwest.

There is a depth of 55 fathoms (100.6 m.) in the middle of the entrance to the loch, which decreases to 20 fathoms (36.6 m.) 1,800 yards within, and to 10 fathoms (18.3 m.) near the head. The loch is not safe as an anchorage except during fine weather.

**Tidal currents.**—The tidal currents off Loch Buy are very irregular, and the rate seldom exceeds a knot at springs.

**The coast of Mull from Rudha na Faoileann, the eastern point of the entrance to Loch Buy, trends southeastward 1.9 miles to a headland, the southern point of Mull, close off which is Eilean straid Eun; it is rocky and steep-to. Nine hundred yards from Rudha na Faoileann is Lord Lovat's Cave, which runs in 300 feet, and immediately southeastward of it the Wharf Cliff rises to the height of 809 feet (246.6 m.).**

**Eilean straid Eun** is a flat, rocky islet, about 300 yards in extent and 14 feet (4.3 m.) high, separated from Mull by a passage 100 yards wide with depth of from 3 to  $1\frac{1}{2}$  fathoms (5.5 to 2.7 m.).

**Tidal currents.**—Close inshore at Eilean straid Eun the east-going current runs toward Loch Spelve from  $4\frac{1}{4}$  hours after high water until  $13\frac{1}{4}$  hours before the next high water, but this current forms an eddy on each side of Eilean straid Eun, turning to the westward on its western side toward Loch Buy entrance, and forming a true eddy running westward to the eastward of Eilean straid Eun.

**The coast** from the southern point of Mull trends northeastward 6 miles and is steep-to throughout. It then turns north-northeastward about a mile to the entrance to Loch Spelve ( $56^{\circ} 23' N.$ ,  $5^{\circ} 41' W.$ ), and off this part rocks and foul ground extend 300 yards in places.

**Magnetic disturbances** of the compass have been reported in Lochs Buy and Spelve.

**Loch Spelve.**—The entrance to Loch Spelve turns from northwest to west within the distance of 1 mile and is 400 yards in width, but at low water the navigable channel, with 2 fathoms (3.7 m.) least water, which lies on the northern shore, is contracted to 50 yards. Within the entrance the loch opens into two broad arms, one trending northward  $1\frac{1}{2}$  miles, the other westward  $2\frac{1}{2}$  miles.

The head of the western branch is distant 600 yards from Loch Uisg, a narrow sheet of fresh water  $1\frac{1}{2}$  miles long, the surplus water from which falls into the head of Loch Buy. The depth just within the entrance to Loch Spelve is from 30 to 20 fathoms (54.9 to 36.6 m.), whence it decreases gradually toward each shore and toward each head of the loch. The best anchorage is in a bight at the northern end of the loch, in from 6 to 7 fathoms (11 to 12.8 m.). The chart is the only guide.

There is a pier at Croggan ( $56^{\circ} 23' N.$ ,  $5^{\circ} 43' W.$ ) on the southern shore within the entrance to the loch. Steamers between Oban and Tobermory call here.

**Light.**—A fixed white light is exhibited 20 feet (6.1 m.) above water from the pier at Croggan from November to April.

**Tidal currents.**—The currents attain a rate of  $3\frac{1}{2}$  knots through the entrance channel at springs. The exact time of the turn of the currents is a little uncertain, but probably the current runs in from  $5\frac{3}{4}$  hours before till about a quarter of an hour after high water, and out from a quarter of an hour after high water till  $5\frac{3}{4}$  hours before the next high water.

**The coast of Mull** from Loch Spelve trends northeastward  $2\frac{1}{4}$  miles to the entrance to Loch Don. It is generally steep-to without off-lying shoals, and with depths of 5 fathoms (9.1 m.) at the distance of 200 yards off it, except in the vicinity of Port Donna, where the 5-fathom (9.1 m.) curve is 300 yards from the shore.

**Loch Don**,  $\frac{1}{4}$  mile wide at its entrance, is small and shallow, and only used by small vessels waiting tide to enter the Sound of Mull. Shelter can be obtained from winds between southwest and northwest off its entrance; in about 6 fathoms (11 m.), the eastern extremity of the Isles of the Sea being kept open of the land southwestward of the loch. The anchorage is very limited, as the water suddenly deepens from 6 to 13 fathoms (11 to 23.8 m.), in which depth the tidal currents attain a rate of from 2 to 3 knots at springs.

At Grass Point, just within the southern entrance point of the loch, there is a boat pier and a small white cottage.

**The coast** between Loch Don and Duart Point, 2 miles northeastward, is foul for 1 mile from the loch, and there are several rocks and islets close inshore, with shoal water over 200 yards outside them. The remainder of this coast is steep-to.

**Beacons.**—Two beacons, painted red and white in stripes and surmounted by diamond shapes, erected on the coast nearly  $\frac{1}{2}$  mile southwestward of Black Memorial Tower, mark the landing place of a telegraph cable.

**Light.**—A group flashing white light with red sector, 45 feet (13.7 m.) above water, visible 12 miles, is shown from a gray granite



building. The power of the light is small and its range of visibility unreliable. The lighthouse is the William Black Memorial Tower and is situated on a point about 1,400 yards southward of Duart Point.

**The southern approach** to the Sound of Mull, between Eilean Musdile (on which is Lismore Lighthouse) and the land of Duart Point, is 1.3 miles across, with depths of from 15 to 40 fathoms (27.4 to 73.1 m.) water between; but Ladys Rock, marked by a light beacon, lies  $\frac{1}{2}$  mile southwestward from Eilean Musdile, and is distant 1,800 yards from the coast of Mull.

**Duart Point** ( $56^{\circ} 27' N.$ ,  $5^{\circ} 39' W.$ ) is rocky, with deep water close-to, and near the point stands Duart Castle, a conspicuous object.

**Duart Bay**, on the northern side of Duart Point, is  $\frac{3}{4}$  mile wide, but unsuitable for anchorage, as there is deep water too close to the low-water line, which sweeps with a slight curve between the two points of the bay. If necessary, anchorage can be obtained in 13 fathoms (23.8 m.) with the southwestern point of Eilean Musdile in range with Duart Point, and the Duart House in range with the first point southwestward of the pier. Duart House is situated amidst wood on the western shore of the bay.

A pier is situated 300 yards southward of Rudha Ghuirmein, the western point of the bay. It is marked by an iron perch at the outer end and a boathouse at the inner end. A rock which dries 2 feet (0.6 m.) is situated 150 yards northeastward of the pier, and a rock with 5 feet (1.5 m.) water lies 50 yards farther eastward.

**Tides and tidal currents.**—It is high water, full and change, at Duart Bay, at 5h. 24m.; springs rise  $13\frac{3}{4}$  feet, neaps  $9\frac{1}{2}$  feet; neaps range 4 feet.

Strong tidal currents set along shore immediately outside and across the mouth of Loch Don, the northeast-going current running from  $5\frac{3}{4}$  hours after high water to a quarter of an hour before the next high water, at a rate of  $2\frac{1}{2}$  to 3 knots at springs, and producing overfalls about  $\frac{1}{2}$  mile from the shore. The northeast-going current following the coast, turns into the Sound of Mull. The current from the Sound of Mull runs along shore to the southward and southwestward, at a similar rate, from a quarter of an hour before until  $5\frac{3}{4}$  hours after high water, and also crosses the mouth of Loch Don.

**The coast** of Mull from Rudha Ghuirmein trends northwestward 1,800 yards to Rudha na Sroine. It is foul, and should not be approached to less than 400 yards.

A bank, with depths of from 9 to 15 fathoms (16.5 to 27.4 m.), extends northeastward from this coast, a depth of 10 fathoms (18.3 m.) being found at a distance of  $\frac{3}{4}$  mile  $58^{\circ}$  from Rudha na Sroine.

Temporary anchorage may be obtained on this bank, but not nearer to the shore than 500 yards.

**Craignure Bay**, a shallow indentation 1,200 yards wide, between Rudha na Sroine and Java Point, affords shelter from winds between west, northwest, through west, and south. The best anchorage for small vessels is in about 5 fathoms (9.1 m.), sand, with Lismore Lighthouse in range with Rudha na Sroine, and anchorage for large vessels may be obtained in a depth of 13 fathoms (23.8 m.), with Duart Castle open of Rudha na Sroine bearing  $124^{\circ}$  and the Free Church Manse (the northernmost two-storied house) bearing  $250^{\circ}$ .

At the southern end of the bay is a stone pier, on the inner side of which small vessels can lie in 10 feet (3.1 m.) at high water.

A high flagstaff stands on the shore westward of the pier, and there is a church with a belfry and an inn painted white on the southern shore of the bay.

On the northern side of Craignure Bay is Java Lodge, a conspicuous white building with a wooded background. There is a flagstaff on the hill above it.

The post and telegraph office is near the middle of the head of the bay. The mail steamers between Oban and Tobermory call daily except Sundays.

**The coast** from Java Point trends northward about 1,400 yards to Scallastle Point, between which and Rudha an Ridire, on the mainland to the northeastward, distant  $1\frac{1}{4}$  miles, is the entrance to the Sound of Mull.

**Sound of Mull.**—For the northeast coast of Mull, with the sound from the northern entrance, see next chapter.

**The coast** of the mainland (continued from preceding chapter), fronting the southeastern coast of Mull, is much broken by deep lochs with many off-lying islands and rocks.

**Barnacaryn Bay** ( $56^{\circ} 21' N.$ ,  $5^{\circ} 33' W.$ ), on the southern side of the entrance to Loch Feochan, is about 700 yards wide, and it falls back the same distance, but is very shallow and much encumbered by rocks. With good local knowledge it affords shelter to vessels of light draft from winds between west and east, through south. A reef of rocks extends 200 yards northeastward from the western point of the bay, and a detached sunken rock lies off the middle of the bay 350 yards west-northwestward from the eastern point.

**Loch Feochan.**—The entrance to this loch lies between a small islet steep-to, off the eastern point of Barnacaryn Bay, on the southern side, and Minard Point on the northeastern side. It is 500 yards wide, with a central depth of 14 fathoms (25.6 m.). At 1,400 yards southeastward from the entrance the shores are 200 yards apart at

high water, and the channel is 50 yards wide at low water. From these narrows the loch trends eastward 3 miles with a general width of 500 yards.

About 800 yards within the entrance navigation is impeded by a bar of sand and shingle  $\frac{3}{4}$  mile long, the least depth over which, in a narrow channel near the northern shore, is about 3 feet (0.9 m.) at low water. This channel is too narrow and tortuous to be navigated, even by small vessels, until the last quarter flood. Inside the bar the water deepens to 12 fathoms (21.9 m.) and thence there is deep water in mid-channel between the shores of the loch to the second bar, about 330 yards broad and 1,800 yards farther in.

The second bar is marked by a small islet, in the middle of the channel. The deeper channel is on the northern side of this islet.

Euchar River runs into the loch on the southern side at the first bar and is crossed by a bridge at Kilninver.

**Anchorage.**—There is anchorage ( $56^{\circ} 21' N.$ ,  $5^{\circ} 30' W.$ ) between the two bars in 5 fathoms (9.1 m.) off Ardentallan House on the northern shore, and about 500 yards westward of the second narrows.

**Tides.**—It is high water, full and change, off Ardentallan House at 5h. 31m.; spring rise 9 feet, neaps  $6\frac{1}{2}$  feet. The entrance to the loch is so impeded by sand banks that at low-water springs the level of the water inside the bar is 3 feet above the level outside. The current runs into the loch for about 4 hours, from  $3\frac{3}{4}$  hours before till a quarter of an hour after high water, and out of the loch from a quarter of an hour after high water till  $3\frac{3}{4}$  hours before the next high water. The rate of these currents over the bar and through the narrows is 5 knots at springs.

**Kerrera Island** is about 4 miles long northeast and southwest, and has a general breadth of  $1\frac{1}{2}$  miles, but of from 400 to 800 yards near its northeastern end. It is remarkable for the rugged nature of its outline, and attains a height of 628 feet (191.4 m.) at Carn Breugach, its highest point. Kerrera Sound is the channel between Kerrera Island and the mainland, and near its northeastern end is Oban Bay, with the town of Oban on its shores.

**Rudha Seanach**, the southwestern point of Kerrera, is low, rocky, and steep-to. Castle Bay, the bight on its northwestern side, does not afford anchorage. The ruins of Gylen Castle stand on the cliffs at the head of the bay.

**Ardmore Bay**, the next bight to the northwestward affords temporary anchorage and shelter from northerly winds in about 11 fathoms (20.1 m.) nearly 300 yards from the shore, but the southwestern coast of Kerrera is too open except for temporary anchorage.

Rocks with less than 6 feet (1.8 m.) water lie nearly 200 yards southward, and two detached rocks, close together, with  $1\frac{1}{2}$  fathoms

(2.7 m.) of water, lie 200 yards southwestward from Oronsay, which is connected with Kerrera at low water and forms the western point of Ardmore Bay.

**Ru na Fuinduin**, the western point of Kerrera, is distant 1.1 miles northwestward from Rudha Seanach, and is steep-to.

**Bhaic Isle**, about 350 yards in extent, lies 600 yards northwestward from Ru na Fuinduin. It is low and flat, except in the middle, where a vertical sided knoll rises to a height of 51 feet (15.5 m.). Rocks extend 100 yards off its southern point.

**Dubh Sgeir** ( $56^{\circ} 22' N.$ ,  $5^{\circ} 37' W.$ ), a bifurcated islet or rock, a little more than 200 yards in extent, lies  $234^{\circ}$ ,  $1\frac{1}{4}$  miles, from Ru na Fuinduin. There is deep water at the distance of 150 yards around the islet.

**Bogha Nuadh**, a rock, with 2 feet (0.6 m.) least water, lies  $250^{\circ}$  800 yards from Dubh Sgeir, with deep water between. A narrow ridge with depths of from 9 to 20 fathoms (16.5 to 45.7 m.) connects Bogha Nuadh with Sheep Isle.

**Light buoy**.—A spherical light buoy, painted red and white in horizontal bands and showing a flashing white light is moored in about 7 fathoms (12.8 m.) on the southwestern side of Bogha Nuadh.

Tighthead Islet open one point northwestward of Sheep Isle,  $204^{\circ}$ , leads northwestward; Rudha Seanach in range with the middle of Dubh Sgeir,  $85^{\circ}$ , leads northward; and the summit of Bhaic Isle in line with the eastern end of Dubh Sgeir,  $35^{\circ}$ , leads southeastward of Bogha Nuadh.

**The coast** of Kerrera Island from Ru na Fuinduin trends northeastward about 2 miles to Rudha na Lice. It is steep, and on it are the small bays Port Phadruig and Bar nam Boc. From Rudha na Lice the coast turns eastward for 2.3 miles to Rudha Bhearnaig, the northern extremity of the island.

**Eilean nan Gamhna**, 1,600 yards east-northeastward of Rudha na Lice, and separated from Kerrera by a shoal rocky passage 200 yards wide, is nearly 400 yards in extent and the largest of 3 small islets, connected with each other at low water. Its northern coast is clear and moderately steep-to, but a patch, with  $3\frac{3}{4}$  fathoms (6.9 m.) least water, lies 300 yards northward of the island; Sgeir Dhonn, in range with the summit of Ardantive Hill,  $91^{\circ}$ , leads northward of it.

**Sheep Island**,  $\frac{1}{4}$  mile eastward from Eilean nan Gahmna and 150 yards off the western point of Oitir More Bay, is small. Two detached patches of rocks lie northward of the island, the outer patch, with a depth of 2 feet (0.6 m.) at low water, being 300 yards distant.

**Sgeir Dhonn** ( $56^{\circ} 25' N.$ ,  $5^{\circ} 31' W.$ ), about 500 yards northeastward from Sheep Island, is a cluster of small rocks 4 feet (1.2 m.)

high. Rudha na Lice, open northward of Eilean nan Gamhna, 240°, or Dunollie Castle, seen over Rudha Bhearnaig, 84°, leads northward of Sgeir Dhonn.

1. **Oitir More Bay**, on the northern side of Kerrera, eastward of Sheep Island, affords anchorage to small vessels except from north-northwest to northeast winds. The best position is in about 6 fathoms (11 m.) with the highest part of Maiden Island in range with the high-water mark of Rudha Bhearnaig, and the southern side of Sheep Island in range with the knoll in the middle of Eilean nan Gamhna.

2. **Wilson Rock**, about 150 yards southwestward of the western end of Rudha Bhearnaig, is just awash at high water, and steep-to on its seaward side. The southern end of Maiden Island, open northward of Rudha Bhearnaig, leads northward of the rock.

3. **The North Channel**, into Kerrera Sound or Oban Bay, between the northeastern end of Kerrera and the coast of Dunollie, has a least width of 250 yards. A ledge of rocks extends northeastward 200 yards from the middle of the northeast coast of Kerrera.

4. **Beacon**.—A red iron beacon, 33 feet (10.1 m.) high, surmounted by a barrel-shaped cage, stands on the outer part of the above-mentioned ledge, but shoal water extends 40 yards beyond the beacon. Abreast the beacon the navigable channel with depths over 5 fathoms (9.1 m.) is 300 yards wide, and in the narrows, about 500 yards southeastward, it is 100 yards wide.

**Maiden Island**, 600 yards northeastward from the northern end of Kerrera and in the entrance to the North Channel, is 350 yards long north and south and 85 feet (25.9 m.) high. It is steep-to, except that foul rocky ground extends about 50 yards off its western end.

The distance between Maiden Island and the coast of Dunollie is about 400 yards, but reefs run out nearly 400 yards from the mainland abreast of the island, and leaves a very narrow channel, vessels using it pass within 40 yards of the island; it is much used by local steamers, but requires local knowledge.

**Kerrera Sound**, between Kerrera Island and the coast of Mid-Lorn, is nearly 4 miles in length with breadth varying from about  $\frac{1}{4}$  to  $\frac{3}{4}$  mile. It is a safe navigable channel, forming the approach to Oban Bay, much frequented by steamers, yachts, and the smaller description of coasting vessels. The shoals, though numerous, are well marked, and during daylight easily avoided. There is good anchorage in Horseshoe Bay.

5. **The Southwest Channel—Rock**.—About 1,300 yards northeastward of Rudha Seanach, the southern point of Kerrera, within the sound, and 150 yards offshore, is a small detached rock with  $2\frac{1}{4}$  fathoms (4.1 m.) water.

**Cutter Rock**, 1,600 yards northeastward of Rudha Seanach and 200 yards offshore, dries 6 feet (1.8 m.). It is the southern rock of a ledge extending northeastward nearly 400 yards to Sgeirean Dubha. The ground between Cutter Rock and the shore is rocky and foul.

**Sgeirean Dubha**, about 1,900 yards northeastward of Rudha Seanach and 300 yards from the coast of Kerrera, is three low rocks above water. Sgeirean Dubha is steep-to.

**Light**.—A group flashing white light, 24 feet (7.3 m.) above water, visible 9 miles, is shown from a white cylinder on a concrete base, 22 feet (6.7 m.) high, on Sgeirean Dubha.

**Leading marks**.—Dunollie Castle seen over the eastern bluff of Kerrera, 31°, or, as this mark is somewhat indistinct at times, Creag Moraig (with the houses on the northern shore of Oban Bay) opening over the extremity of the land under Dun Uabairtich, leads southeastward of all the above-mentioned rocks off the coast of Kerrera.

**Anchorage** may be obtained northward of Sgeirean Dubha, between it and Kerrera, in about 7 fathoms (12.8 m.).

**Sgeir an Fheurain** (56° 23' N., 5° 32' W.), a rock 70 yards in extent, which dries 1 foot (0.3 m.), lies 70 yards northward of Rudh' an Fheurain, on the mainland, and is distant 450 yards from Sgeirean Dubha. Shoal water extends 100 yards westward of the rock, and the width of the navigable channel between it and Sgeirean Dubha is 300 yards.

The south cliff of Dun Uabairtich, in range with Puddingstone Point, leads northwestward of this rock, and the summit of a remarkable basaltic cliff opposite the Horseshoe, in range with the high-water mark near Middle Gallanach Farm, 34°, leads just clear of it. These marks do not appear to be clear, and must be used with caution.

Two 4½-fathom (8.2 m.) patches lie 200 yards northward from Sgeir an Fheurain.

**Little Horseshoe Shoal**, about 100 yards in length, with 3 feet (0.9 m.) water on its shoalest part, lies about 150 yards off Little Horseshoe Bay, a small circular bight in Kerrera Island 900 yards northeastward of Sgeirean Dubha, the intervening coast being steep-to at the distance of 150 yards. There is a narrow passage on either side of the shoal leading into the bay, where small vessels anchor in from 1½ to 3 fathoms (2.7 to 5.5 m.), good holding ground.

**Buoy**.—A black can buoy is moored 40 yards southward from the shoalest part of the Little Horseshoe Shoal in about 3 fathoms.

The high-water point inside Sgeirean Dubha, in range with the extremity of Seil Island, leads southeastward of the shoal.

**Horseshoe Bay**, about 600 yards northeastward of Little Horseshoe Bay, the coast between being steep-to, is occasionally used by weather-bound vessels. It has a moderate depth of water, good holding ground, and affords shelter from all winds.

A rock, with  $1\frac{1}{2}$  fathoms (2.7 m.) of water, lies 200 yards from the shore 400 yards northeastward from the southern point of Horseshoe Bay. Ard na Cuile, in range with Rudh' an Fheurain,  $195^\circ$ , leads close southeastward of it.

**Ferry Rocks** are in mid-channel in Kerrera Sound, eastward of the Ferry Pier, which is situated on the coast of Kerrera about 300 yards eastward of the northeastern point of Horseshoe Bay.

The northwestern patch of rocks, which has a least depth of  $1\frac{1}{2}$  fathoms, is nearly 300 yards long, northeast and southwest, and narrow, within the 3-fathom (5.5 m.) curve. It is distant 250 yards from Kerrera, and there is a channel about 100 yards wide, with a depth of from  $4\frac{1}{2}$  to 7 fathoms (8.2 to 12.8 m.) between.

The southeastern patch of rocks, two of the heads of which have 2 feet (0.6 m.) water marked by kelp showing at low water, is 200 yards long east and west and 150 yards broad within the 5-fathom (9.1 m.) curve, with general depths of from 1 to 2 fathoms (1.8 to 3.7 m.). It is separated from the northwestern patch by a channel 50 yards wide, with depths of  $5\frac{3}{4}$  to  $6\frac{1}{2}$  fathoms (10.5 to 11.9 m.), and from the mainland by a deep channel 100 yards wide between the 5-fathom (9.1 m.) curve.

**Lightbuoy.**—A large red conical lightbuoy, showing a flashing white light, moored in 3 fathoms (5.5 m.), on the northwestern side of the rocks, marks the eastern limit of the northwestern channel, and a black can buoy is moored on the southeastern side of the rocks.

**Rock.**—About 450 yards northeastward from the southeastern end of the Ferry Rocks, and 130 yards northwestward from Rudha Tolmach, a point on the mainland, is a detached patch with 5 feet (1.5 m.) water  $56^\circ 24' N.$ ,  $5^\circ 30' W.$ .

**Buoy.**—A red conical buoy is moored in  $2\frac{1}{2}$  fathoms (4.6 m.) on the western side of this rock.

Craigard Hotel, Oban, a conspicuous building on a hill, well open of Manor House Point,  $58^\circ$ , leads northward of this rock. There is a narrow channel with from  $3\frac{3}{4}$  to 5 fathoms (6.9 to 9.1 m.) water between the rock and the point.

**Heather Island**, nearly 400 yards long northeast and southwest, narrow, and 35 feet (10.7 m.) high, is about 200 yards off Kerrera Islands, 700 yards northeastward of the Ferry Rocks, and there is a depth of from 4 to 7 fathoms (7.3 to 12.8 m.) through the channel, about 60 yards wide, between it and the island, but this channel is almost blocked by a shoal with  $1\frac{1}{2}$  fathoms (2.7 m.) least water

occupying a mid-channel position at its southwestern end. The main channel, 300 yards wide, and deep, lies between Heather Island and the mainland.

A patch of 4 fathoms (7.3 m.) lies  $\frac{1}{4}$  mile, and a patch of  $4\frac{1}{2}$  fathoms (8.2 m.) 600 yards, eastward from the northeastern end of Heather Island.

**Sgeir Rathaid** is a rocky shoal 250 yards long, northeast and southwest, and 100 yards broad, within the 2-fathom (3.7 m.) curve, situated near the middle of the southern entrance to Oban Bay. Its southern end dries 2 feet (0.6 m.), but toward its northern end the depths vary from 1 to 2 fathoms (1.8 to 3.7 m.).

The southern extremity of Heather Island, in range with Carn Breugach, the highest peak of Kerrera,  $235^\circ$ , leads southward of the shoal in a depth of about 3 fathoms (5.5 m.); the southern extremity of Heather Island, in range with the southern extremity of Kerrera,  $218^\circ$ , leads northwestward of it.

**Buoys.**—A spherical buoy, painted black and white in horizontal stripes and surmounted by a staff and diamond, is moored at the southwestern end of the shoal, and a spherical light buoy, painted red and white in horizontal stripes and showing a flashing white light, at the northeastern end.

**Oban Bay** ( $56^\circ 25' N.$ ,  $5^\circ 29' W.$ ), situated on the mainland at the northeastern end of Kerrera Sound, is about  $\frac{1}{2}$  mile wide at its entrance and 700 yards deep. The town of Oban is situated on its shores. Southeastward of the bay, crowning a rocky hill, are the conspicuous ruins of an uncompleted hydropathic establishment. The eastern shore rises to a height of about 250 feet (76.2 m.), the slopes being studded with villas amongst pine woods. McCaig Tower, a circular building on a hill eastward of the North Pier, is noticeable.

The northern side of the bay is backed by well-wooded hills, amongst which is Creag Moraig, a prominent wooded knoll, about 150 feet (45.7 m.) high.

The bay is frequented by passenger and mail steamers, yachts, and steamers engaged in the West Highland coasting trade. There is also a considerable fishing industry.

**Depths.**—There is a depth of from 8 to 10 fathoms (14.6 to 18.3 m.) 100 yards offshore at the head of Oban Bay, and a little more than 200 yards offshore the water deepens suddenly to 20 fathoms (36.6 m.) with 23 and 24 fathoms (42.1 and 43.9 m.) in the middle of the bay, soft mud bottom.

There is a least depth in the approach to Oban Bay through Kerrera Sound of 6 fathoms (11 m.) at low water in the channel between the Ferry Rocks and Kerrera Island, and of 7 fathoms (12.8 m.) at low water in the channel between the Ferry Rocks and the mainland.



There is a least depth of 8 fathoms (14.6 m.) at low water in the approach through North Channel.

**Corran Ledge**, a bank of rocks and shingle, extends from the shore under Creag Moraig to Dunollie Lighthouse, and dries out 200 yards at low water. A sewer outfall runs out across the ledge nearly to the position of the light buoy.

The western part of Greag Island shut in with the eastern point of Maiden Island,  $343^{\circ}$ , leads westward, and the square tower of the Free Church in range with the southwestern extremity of the North Pier,  $129^{\circ}$ , leads southwestward of the ledge.

**Light buoy**.—A black light buoy showing a flashing white light is moored on the outer edge of Corran Ledge to mark the sewer outfall.

**Piers**.—There are four piers in Oban. The Northern Lights Wharf at the southern end of the town has a depth of 14 feet (4.3 m.) alongside it at low water; the South Pier close to it has a depth of  $8\frac{1}{2}$  feet (2.6 m.) alongside it; the railroad wharf alongside which there is 15 feet (4.6 m.) at low water; and the North Pier with a depth of  $8\frac{1}{2}$  feet (2.6 m.) alongside it.

The North and South Piers are stone structures, and all the piers are fitted with cranes. The railroad pier has a 5-ton and a  $2\frac{1}{2}$ -ton crane.

There are also several landing places for boats.

**Lights**.—A fixed red light is exhibited from the middle of the Northern Lights Wharf.

A fixed green light is exhibited from the northwestern end of the South Quay.

A fixed red light is exhibited from the middle of the North Pier.

**Anchorage**.—Oban Bay is very deep for anchorage. A good position for anchoring is in about 23 fathoms (42.1 m.) with the southern extremity of Heather Island in range with Carn Breugach, and the western extremity of Maiden Island in range with Rhuda Chruidh. This anchorage should be used with caution, as the holding ground is bad, and southwesterly winds blow with great force up Kerrera Sound. Ships with high freeboard should vacate the anchorage during southwesterly gales. A channel for steamers to the pier is marked by buoys during the yachting season, and anchorage is prohibited within it.

**Ardantrive Bay** ( $56^{\circ} 25' N.$ ,  $5^{\circ} 30' W.$ ), on the coast of Kerrera Island opposite Oban Bay, is about  $\frac{1}{4}$  mile wide at its entrance and 300 yards deep, with depths of  $5\frac{1}{2}$  to 10 fathoms (10.1 to 18.3 m.) 100 yards from the shore, except a rocky spur which extends 200 yards from its southwestern point. The bay

affords well-sheltered anchorage with good holding ground, and during strong northwesterly winds is preferable to Oban Bay.

Several yachts' mooring buoys are placed in the bay, most of which are spherical buoys painted red.

**Wreck.**—A wreck (1922), with two masts showing above water, lies near the extremity of the rocky spur extending from the southwestern point of the bay.

**Light.**—A fixed white light with red sectors, 16 feet (4.9 m.) above water, visible 8 miles, is shown from a stone beacon, 10 feet (3.1 m.) high, on the low cliff on the eastern side of the North Channel into Kerrera Sound.

**Dog Stone**, on the low shore 100 yards northward of Dunollie Light Beacon, is an isolated mass of conglomerate, resembling an inverted cone. There are also large masses of this conglomerate, fragments which have rolled down from the cliffs, near the southern entrance to Oban Bay.

**Port More** is a small shallow bight situated between the Dog Stone and Dunollie Castle. The undulating ground above it rises somewhat steeply to a dark wooded hill.

**Dunollie Castle**, in ruins, stands on the summit of a precipitous ivy-clad cliff within Carraig Mhicheil, a rounded point rising to the height of 143 feet (43.6 m.), situated 450 yards northward of Dunollie Light Beacon. The castle is not conspicuous except from the southeastward. The modern Dunollie House stands a little northeastward of the castle.

**Tides and tidal currents.**—It is high water, full and change, at Oban 5h. 34m.; springs rise  $11\frac{1}{4}$  feet, neaps  $8\frac{1}{4}$  feet. Soundings are reduced to  $1\frac{1}{4}$  feet below low water ordinary springs.

In Kerrera Sound the northeast-going current begins  $4\frac{1}{4}$  hours after high water, and the southwest going current begins  $13\frac{1}{4}$  hours before high water. The change of current takes place somewhat later at the southern entrance and somewhat earlier in the North Channel. The currents attain a rate of from one to  $1\frac{1}{2}$  knots, but in the North Channel of  $2\frac{1}{2}$  knots.

**Directions.**—Approaching Oban Bay ( $56^{\circ} 25' N.$ ,  $5^{\circ} 25' W.$ ) from the southward through Kerrera Sound: Keep Dunollie Castle in sight over the eastern bluff of Kerrera, to clear Sgeirean Dubha and the shoals southwestward of it. Pass 150 yards eastward of Sgeirean Dubha Beacon, and then keep in mid-channel until abreast of the ferry pier on Kerrera Island. Then steer to pass between the island and Ferry Rocks Red Light Buoy, and when the Roman Catholic Chapel on the northern shore of Oban Bay is shut in with the southern side of Heather Island steer to pass along the southeastern side of that island and on either side of Sgeir Rathaid to

the anchorage. The depth in mid-channel between Sgeir Rathaid Southwest Buoy and the shore is  $4\frac{1}{2}$  fathoms (8.2 m.), and vessels of deep draft must pass northward of Sgeir Rathaid.

Approaching from the northward: Pass 200 yards westward of Maiden Island and steer direct for Dunollie Light Beacon until nearly abreast of Dunollie Castle, when gradually turn to  $182^\circ$  and pass in mid-channel between Rudha Chruidh and Dunollie Light Beacon. Leave Corran Ledge Black Light Buoy to the eastward and steer for the anchorage.

Care is necessary in the narrowest part of the channel, abreast of Rudha Chruidh, where a rocky ledge extends 70 yards from Kerrera, and the width of the channel between the 5-fathom (9.1 m.) curves is 100 yards, as the tidal currents are strong and there are no good leading marks.

Give Corran Ledge a good berth; the distillery chimney in range with the northern end of Ardconnel Lodge, a conspicuous villa on a hill, leads southwestward of it; but during the autumn and summer months any marks are very difficult of recognition in consequence of the usually crowded state of the anchorage.

The channel inside Maiden Island requires local knowledge.

**The town of Oban** is a summer resort and the tourist headquarters of the West Highlands. It has some 30 hotels, the principal of which are conspicuous from the bay. The population was 5,557 in 1901.

**Repairs.**—Moderate repairs can be effected to hull and machinery.

**Supplies** of all descriptions can be obtained. Coal is obtainable. Vessels can coal in the anchorage from lighters or alongside one of the piers. Lighters, fitted with steam winches and derricks, carrying collectively about 480 tons, are kept ready loaded.

**Water** is laid on to the piers from the town supply, and is suitable for all purposes. There are 2 water boats of 50 and 12 tons capacity, respectively, fitted with steam pumps.

**Communications.**—Oban is connected by railroad with Calender and from thence with the general system of the Caledonian Railway. There is also steamship communication with Glasgow, Stornoway, and the Western Isles. There are post, telegraph, and telephone offices in the town.

**The coast** from abreast of the northern end of Maiden Island trends northward about 600 yards to Ru na Hearba ( $56^\circ 26' N.$ ,  $5^\circ 29' W.$ ), close northwestward of which is Sgeir an Eigne. The water is deep 100 yards northwestward of the sgeir, but a shallow flat of  $2\frac{1}{4}$  fathoms (4.1 m.) extends 550 yards northward from it.

**Ganovan Bay** lies immediately eastward of Ru na Hearba. Its shores are irregular both in outline and height, and the bay is gen-

erally shallow, with several detached rocks near its head. The bay is unsuitable for anchorage except by small vessels with local knowledge and during fine weather.

**Telegraph cable.**—A telegraph cable has been laid between Ganovan Bay and the Island of Mull.

**Dunstaffnage Point**, 1 mile eastward from the northeastern point of Ganovan Bay, and the outer southern entrance point to Loch Etive, is a low wooded promontory on which are the extensive ruins of Dunstaffnage Castle, a large quadrangular building with round towers at three of the angles. Detached from the castle is a small chapel in a burial ground.

**Dunstaffnage Isle** ( $56^{\circ} 27' N.$ ,  $5^{\circ} 26' W.$ ), 150 yards eastward of Dunstaffnage Point, with depths of from 3 to 7 fathoms (5.5 to 12.8 m.) in the channel between, is  $\frac{1}{4}$  mile long northeast and southwest and 150 yards broad.

**Eilean Beg**, 200 yards northeastward of Dunstaffnage Isle, is about 130 yards in extent. There is a narrow passage, with from 1 to 2 fathoms (1.8 to 3.7 m.) water, close to Eilean Beg, and between it and a ledge extending from Dunstaffnage Isle.

A rocky ledge extends 100 yards northeastward from Eilean Beg, and there is a detached rock which dries 5 feet (1.5 m.) nearly the same distance northward of the isle.

**Loch Etive** is a narrow inlet trending eastward 7 miles and then turning sharply northeastward  $8\frac{1}{2}$  miles to its head. Its breadth varies from nearly  $\frac{3}{4}$  mile to 200 yards. Loch Etive is only available for small vessels, its entrance being narrow and shoal.

There is a bridge over the Connel Falls at the entrance.

**Depths.**—There is a depth of about 2 to 4 fathoms (3.7 to 7.3 m.) in Connel Sound; the entrance narrows to the loch. Within the entrance the depths are in many places great, in the upper half of the loch the central depth for upward of  $3\frac{1}{2}$  miles being between 50 and 76 fathoms (91.4 and 139 m.).

**The shore** within Dunstaffnage Point makes a sudden bend southwestward for nearly  $\frac{1}{2}$  mile and then turns eastward for nearly 1 mile to Ru ard nan Leum. Dunstaffnage Bay, the bight thus formed, is only partially available for anchorage, an extensive shallow of sand and boulders running off a considerable distance from the shore to the low-water line, and a sandy flat, with from 1 to 2 fathoms (1.8 to 3.7 m.) extending from Dunstaffnage Isle to Ru ard nan Leum, and completely round the bay.

**Anchorage.**—That part of the bay which is available for anchorage is well sheltered, and is frequented by vessels waiting tide to pass through the Falls of Connel. The best position is in about 5 fathoms (9.1 m.) sand bottom, with Ru ard nan Leum in range with

Connel North Ferry Inn and Lochnell Tower on a hill on the north-western side of Lochnell Bay, in range with the high-water mark of Dunstaffnage Point. Here vessels are out of the tidal currents.

**Ru ard nan Leum** ( $56^{\circ} 27' N.$ ,  $5^{\circ} 25' W.$ ), a low marshy point with a rocky termination, is the inner southern entrance point to Loch Etive, and is steep-to on its northeastern side, but the edge of the sandy flat bordering the southern side of the channel extends in an irregular line between it and Eilean Beg. A rock with 1 foot (0.3 m.) water lies 100 yards northwestward of the point.

**Ledaig Point**, the northern entrance point to Loch Etive, is low and grassy. Ledaig Spit a broad flat of gravel and bowlders, dry at low water, extends 800 yards northwestward from the point, whence its edge turns eastward toward the shore, but a flat with from 1 to 2 fathoms (1.8 to 3.7 m.) water extends 300 yards westward and  $\frac{1}{2}$  mile northwestward from the spit. There is a depth of 6 fathoms (11 m.) 130 yards southwestward from the point.

The channel between Eilean Beg and the flat extending off Ledaig Spit is the deepest into the sound. It has a least depth of 3 fathoms (5.5 m.), is very tortuous, only 100 yards wide, and no leading marks are available for it.

**Salmore Bay**, southeastward of Ru ard nan Leum, is 500 yards wide and deep; but a beach of gravel and bowlders extends 200 yards from its head. It affords anchorage in about 7 fathoms (12.8 m.) while waiting tide to go through Connel Sound, with Connel Sound Ferry Inn just open northward of Salmore Point, Locknell Tower just open eastward of Ru ard nan Leum. Here the tidal current is weak.

**Connel Sound**, above Ledaig Point, is the entrance to Loch Etive. This channel,  $\frac{1}{2}$  mile above the point, is 200 yards wide and divided in mid-channel by a rock, which dries, the upper portion of a ledge about 100 yards wide extending with general depths of 4 to 5 fathoms (7.3 to 9.1 m.) across the sound. This ledge rises suddenly from a basin with 11 and 12 fathoms (20.1 to 21.9 m.) water on the loch side, but the water deepens rather less suddenly outside it.

At low water springs the height of the water inside the ledge is about 4 feet above the level of the water outside, and a fine cascade, named Connel Falls, is produced, which continues with a greater or less fall so long as the water inside is higher than the water outside the ledge.

About 100 yards northeastward of the central rock in this ledge is a rock which dries  $4\frac{1}{2}$  feet (1.4 m.); between these rocks is the North Channel, much narrower and less direct than the South Channel. Below the falls on each shore is a ferry inn, both houses being white and conspicuous.

A railroad bridge, 50 feet (15.2 m.) above high water, crosses Connel Narrows.

**Tides and tidal currents.**—It is high water, full and change, at Connel Ferry Pier, just outside the falls, at 5h. 26m.; springs rise 10 feet. Generally the current will be found running in from about 3¼ hours before until 1¾ hours after high water and running out from 1¾ hours after high water until 3¼ hours before the next high water.

**Directions.**—To proceed through Connel Narrows (56° 27' N., 5° 23' W.) do not approach the falls until about 3¼ hours before high water. Pass through the channel between Dunstaffnage Island and Point, keeping close to the island, and then gradually bring its southern point in range with the northern extremity of Dunstaffnage Castle, which range leads over the shoal flat in from 1½ to 2 fathoms (2.7 to 3.7 m.) of water; when the northern end of Dunstaffnage Island is in range with the summit of Greag Island, keep it so astern; this range leads northeastward of the 1-foot rock near Ru ardan Leum. When the middle of Dunstaffnage Castle is in range with Ru ardan Leum, 268°, keep it so astern through the South Channel of Connel Narrows.

**Seven-foot Rock** lies nearly in mid-channel 800 yards above the central rock in Connel Sound. The middle of Dunstaffnage Castle in range with Ru ardan Leum leads northward of the Seven-foot Rock.

**Kilmaronaig Narrows** are 1 mile above Connel Falls, and here, though the shores of the loch are over 600 yards apart, the channel is close to the northern shore and contracted to 150 yards in width by several small islets and rocks. After passing through these narrows, the northern shore turns northward for ½ mile and then again eastward, increasing the width of the loch to 1,200 yards.

Achnacreamore Bay, thus formed, affords good anchorage in from 5 to 9 fathoms (9.1 to 16.5 m.), sand and shells. A rock, which dries 1 foot (0.3 m.), lies 200 yards from the shore at the inner part of the bay.

**Kilmaronaig Shoal** is a detached narrow patch, with 3 feet (0.9 m.) least water 200 yards eastward of Kilmaronaig Point, but there is a depth of 2¾ fathoms (5 m.) between it and the shore. Highwood House, in range with the southern extremity of Abbots Islet, 117°, leads northeastward of this shoal.

**Stonefield Bay** is a bight between Highwood Point and a low grassy tongue of land dividing the indentation between it and Kilmaronaig Point. About 200 yards northwestward of Highwood Point are two small islets connected at low water, Abbots Islet being the southwestern one. Between these islets and the shore is a narrow channel with from 2 to 5 fathoms (3.7 to 9.1 m.) water.

The entrance to the bay is  $\frac{1}{4}$  mile wide between Abbots Islet and the low tongue of land, the bay falling back 600 yards and being available for anchorage. A good position is in 4 fathoms (7.3 m.) with Kilmarenaig Point just open of the tongue of land and the southern end of Abbots Islet in range with Highwood Point.

**Tides.**—It is high water in Stonefield Bay  $1\frac{1}{2}$  hours later than high water at Connel Ferry Pier.

**Highwood Point** is low, grassy, and rises to a wooded height a short distance inland. In the midst of the wood is Highwood House, a gray castellated building, whose turrets and chimneys are visible above the surrounding trees. Highwood Point, Runicairn Point,  $\frac{1}{2}$  mile eastward, and Airds Point, 1.6 miles eastward, are steep-to. The bights between are also clear and may be approached to 200 yards, except in the vicinity of the Sgeir nan Ron, a rock, dry at low water, lying 200 yards southeastward of the second point south-eastward of Runicairn Point.

On the northern shore northward of Highwood Point are two small islets, the outer one, which is steep-to, being distant 150 yards. Thence eastward to Ardchattan, a distance of a little over 1 mile, the shore may be closed to about 200 yards. Ardchattan Priory, which is a large mansion, and, a little farther on, the manse are close to the shore and are surrounded by wood, backed by mountains.

**Ardchattan Shoal**, 400 yards  $224^\circ$  from the manse, is a small isolated rock with  $1\frac{1}{4}$  fathoms (2.3 m.) and deep water around. Runicairn Point in range with Highwood House,  $257^\circ$ , leads southward of the shoal; to pass northward of the shoal keep within 200 yards from the shore between the priory and manse.

**Airds Bay.**—The southern shore of the loch from Airds Point turns southward nearly  $1\frac{1}{2}$  miles, then it bends around eastward and northeastward, forming Airds Bay ( $56^\circ 26' N.$ ,  $5^\circ 14' W.$ ), its eastern end terminating in a low tongue of marshy land formed of silt from the Awe River, with a pier whence the ferryboat plies to Eilean Duranis, on the opposite shore, a distance of 250 yards.

Airds Bay, being deep close to the shore, is not suitable for anchorage. Vessels unload and take in cargo alongside a pier in the southeastern part of the bay, principally in connection with the adjacent smelting works. The Naint River flows into Airds Bay  $\frac{1}{2}$  mile westward of the Awe River.

**Eilean Duranis.**—The northern shore of the loch is steep and clear from Ardchattan to Eilean Duranis, which is 700 yards in length, 136 feet (41.5 m.) high, and connected with the northern shore at low water by a dry strand and at high water by a bridge 50 feet long. Within the island to the eastward is a small natural harbor frequented by vessels shipping stone from the adjacent granite quarries.

Close eastward of the island is a small rocky islet; the 2-fathom (3.7 m.) passage between is sometimes used by vessels at high water, but at low water it is only about 30 yards wide. Midway between the islet and the point next eastward is good anchorage in 14 fathoms (25.6 m.) about 200 yards from the shore.

**Awe River** is supplied by the waters of Loch Awe, a fresh inland lake about 6 miles distant to the southeastward, the mean level of which is 118 feet (36 m.) above the mean sea level.

A large quantity of water rushes at a great rate over the narrow rocky bed of the river through the gloomy pass of Awe and debouches into Loch Etive, southward of Eilean Duranis. The silt at the mouth of the Awe River forms a spit which extends eastward about  $\frac{1}{4}$  mile from the low tongue of marshy land before mentioned forming its western entrance point, and narrowing the actual channel to 200 yards; the deepest water, from 6 to 9 fathoms (11 to 16.5 m.) being near the island, which is steep-to. The point next eastward of Eilean Duranis just open southward of the islet eastward of Duranis,  $60^\circ$ , leads through in mid-channel.

**Tides and tidal currents.**—It is high water at Bonawe, on the southeastern shore of Airds Bay, at 7h. 54m.; spring rise  $5\frac{3}{4}$  feet. In the narrows at Bonawe the greatest rate of the ingoing current, which runs for 5 hours, is  $2\frac{1}{2}$  knots, and the greatest rate of the outgoing current, which runs for 7 hours, is  $1\frac{1}{2}$  knots.

**The shores** of the loch now trend eastward and northeastward to its head, a distance of  $8\frac{1}{2}$  miles, the waters being bordered by mountains, remarkable for their height and outlines.

The northern shore is rocky and steep for 1,700 yards eastward of Eilean Duranis to Sgeir Lag, a cluster of small rocks  $4\frac{1}{2}$  feet (1.4 m.) high close to it.

**Rudha nan Uiseagan** ( $56^\circ 29' N.$ ,  $5^\circ 10' W.$ ), about 2 miles farther on, is connected at low water with a rocky islet, to the westward of which is a small bay with snug anchorage for small vessels in 4 fathoms (7.3 m.) mud.

**Dail Bay**, about 1 mile northeastward of Rudha nan Uiseagan, also affords anchorage; from thence northeastward the shore of the loch is almost straight and clear to the head, but an isolated rock lies  $\frac{1}{2}$  mile above the eastern point of Dail Bay and 100 yards from the shore.

**The southern shore** eastward of the eastern entrance point of the Awe River to the northeastern side of Inverliever Bay, a distance of  $3\frac{1}{2}$  miles, is steep-to at 100 yards.

**Inverliever Bay** recedes  $\frac{1}{2}$  mile eastward from the shore line, with a depth of from 14 to 5 fathoms (25.6 to 9.1 m.). A cluster of rocks extends 550 yards off its northern point; some of the rocks are



above water, others uncover. Ru Aird, in range with the inner end of Creag Cot, both on the northern shore  $226^{\circ}$ , leads northward of these rocks, and also of the flat off Kinglas River, 1,600 yards north-eastward of Inverliever Bay, as well of the low-water line farther eastward toward Ru na h aird Rainich; thence to the head of the loch the shore is steep-to.

**Lochnell Bay** is about  $1\frac{1}{4}$  miles across at its entrance between Eilean Beg and Rudha Garbhard, to the northwestward, and extends  $1\frac{3}{4}$  miles northeastward. The southeastern part of the bay is occupied by Ledaig Spit and Flat.

The depths in the bay decrease gradually from 20 fathoms (36.6 m.)  $\frac{1}{2}$  mile within the entrance to 5 fathoms (9.1 m.) at from 400 to 800 yards off its head, but there is a patch  $\frac{1}{4}$  mile long, with  $3\frac{1}{2}$  and 4 fathoms (6.4 to 7.3 m.) water, near the middle of the inner part of the bay. As the bay is open to the southwestward, it is only suitable for temporary anchorage.

**Tidal currents.**—The outgoing current from Loch Etive strikes Rudha Garbhard and is turned to the northward, circulating around the upper part of Lochnell Bay.

**Rudha Garbhard** is the southwestern extremity of Garbhard, a wooded promontory.

**Bogha na Garbhard**, about 500 yards southwestward from Rudha Garbhard, is 100 yards in extent, and dries 1 foot (0.3 m.). There is a depth of 6 fathoms (11 m.) in the fairway of the channel between the point and the rock.

Connel South Ferry Inn in range with the northeastern end of Eilean Beg,  $113^{\circ}$ , leads southwestward of the rock.

**Camus an Fhais** is a bay extending  $\frac{3}{4}$  mile northeastward between Rudha Garbhard and Rudha Fion, with a general width of 600 yards. It is quite open, and there is a good fishing ground at its entrance.

**Lismore Island** is 8 miles long, northeast and southwest, with an average breadth of 1 mile, and of limestone formation throughout. The narrow approach to the Sound of Mull from the Firth of Lorn lies between its southwestern extremity and the Island of Mull; and on either side between it and the mainland are the Lynn of Lorn and the Lynn of Morven, which channels unite northeastward of the island, and, as Loch Linnhe, extend many miles into the interior, with the important tributary Lochs Creran, Levan, Aber, Eil, and Corrie branching from it, and the Caledonian Canal extending from the head of Loch Aber to Inverness, on the east coast of Scotland.

Compared with the surrounding mountainous country, the island is low; the highest hill, Barrow More ( $56^{\circ} 29' N.$ ,  $5^{\circ} 33' W.$ ), about

2½ miles from the southwestern end, being 429 feet (130.8 m.) high. The ruins of several ancient strongholds on Lismore still exist; those of Tirefoor Castle stand on the summit of a grassy knoll, 166 feet (50.6 m.) high, and close to the sea, 1¼ miles northeastward of Ach na Croish, which is situated on the southeastern side of the island, 4¾ miles from its southwestern end; they are circular in shape and built of loose stones without mortar. There is a small flagstaff on Rudha Fiart, the southwestern point of Lismore.

The population of the island was 500 in 1901. There is a ferry between Ach na Croish and Oban; and between Rudha na Aird, the northeastern point of the island, and Appin on the mainland to the southeastward.

**Eilean Musdile**, nearly joined to Rudha Fiart (Dail Point), is 700 yards long and a continuation of the land forming the point. It is in two parts connected by a stone bridge.

**Light**.—A fixed white light, 103 feet (31.4 m.) above water, visible 16 miles, is shown from a white tower, 86 feet (26.2 m.) high, on the southwestern end of Lismore Island. The light is obscured by land from 208° to 237°.

**Sgeir nan Gael**, some 50 yards in extent and 12 feet (3.7 m.) high, lies 200 yards southeastward of Lismore Lighthouse with a depth of 2 fathoms (3.7 m.) between it and the shore. A rock with 4¼ fathoms (7.8 m.) water lies 300 yards southward of Sgeir nan Gael, to which it is connected by a ridge with less than 5 fathoms (9.1 m.) water.

Rocks, some sunken and others which dry, fringe the southeastern coast of Eilean Musdile to the distance of 150 yards, and a bank with depths of from 3 to 5 fathoms (5.5 to 9.1 m.) extends for nearly 600 yards southeastward from the island. A rock, with 3¼ fathoms (5.9 m.) water, is situated on this bank with Lismore Lighthouse bearing 284°, distant 560 yards.

Black Memorial Light Tower in range with Lady's Rock Light Beacon, 265°, leads about 400 yards southward of the shoals southeastward of Eilean Musdile. The red sector of Duart Point Light (Black Memorial Tower) also clears these shoals.

A ledge with depths of 3 fathoms (5.5 m.) and less extends 250 yards southwestward from the southwestern end of Eilean Musdile.

**Ladys Rock** (56° 27' N., 5° 37' W.) is distant ½ mile 220° from Lismore Lighthouse, and there is a channel between with depths of 6 to 14 fathoms (11 to 25.6 m.) in its fairway. The rock is a narrow ledge about 150 yards long northeast and southwest, which only covers during equinoctial springs, and shoal water extends nearly 200 yards around the rock, except on its southeastern side, where it extends 100 yards.

**Light.**—A flashing white light on Lady Rock, 30 feet (9.1 m.) above water, visible 10 miles, is shown from a gray concrete beacon, surmounted by a red cylinder. The base is coated with concrete and whitewashed. The rock is covered by the red sector of Duart Point Light (Black Memorial Tower).

The rock lies nearly in the fairway of the entrance to the Sound of Mull, and great caution and attention to the helm are requisite when passing near it on account of the tidal currents, which even during fine weather occasion a heavy race in the vicinity of the rock and across the channel between it and Eilean Musdile. With strong winds and opposing tidal currents, the overfalls and race are dangerous to small vessels and should be avoided.

**Tidal currents.**—In the Firth of Lorn, the channel southeastward of Mull between Loch Buy and Duart Point, the northeast-going current runs from about  $4\frac{1}{4}$  hours after high water until  $1\frac{3}{4}$  hours before the next high water, and the southwest-going current runs from  $1\frac{3}{4}$  hours before until  $4\frac{1}{4}$  hours after high water; the currents have a rate of about  $2\frac{1}{2}$  knots at springs.

In the channel between the coast of Mull and Ladys Rock the currents run at a rate of 4 knots, and in that between Ladys Rock and Eilean Musdile of 6 knots, setting to the northward from low until high water and to the southward from high until low water.

The north-going current having passed through the channels abreast of Ladys Rock divides into two portions, one setting northwestward through the Sound of Mull and the other northeastward into the Lynn of Morven.

Off Duart Point the south-going current sets along shore at first to the south-southwestward, but the last of that current sets southeastward from Duart Point toward Eilean Musdile; the rate of this current is 2 knots along the coast of Mull and 6 knots between Ladys Rock and Eilean Musdile.

**Lismore Island—Northwest coast.**—Liath Sgeir (Gray Rock) lies 1.1 miles northward of Lismore Lighthouse and 1,200 yards from the island, with depths of from 10 to 39 fathoms (18.3 to 71.3 m.) in the passage between; the rock is about 100 yards across, and dries 8 feet (2.4 m.) at low water.

Shoal water extends around the rock to the distance of nearly  $\frac{1}{4}$  mile, except on its eastern side.

**Clearing marks.**—The southeastern extremity of Mull, in range with the light beacon on Ladys Rock, bearing  $205^\circ$ , leads southeastward; Cnoc an Teine, in range with the light cylinder on Gray Islands, bearing  $287^\circ$ , leads northeastward; the mound on Ru na Fuinduin (the southeastern extremity of Kerrera), in range with the western extremity of Eilean Musdile, bearing  $172^\circ$ , leads west-

ward, and the gap in the trees close northward of Ardtornish Castle in range with the southern extremity of Eilean Rudha an Ridire, bearing  $308^{\circ}$ , leads southwestward of the shoals around Liath Sgeir.

**Bernera Isle** ( $56^{\circ} 30' N.$ ,  $5^{\circ} 35' W.$ ), 2 miles northeastward of Lismore Lighthouse, is connected to the northwestern point of Lismore Island at low water. Bernera Bay, the bight southward of the island, is open to the southwestward and may be used as a temporary anchorage, but when entering or leaving, to avoid the rocks which extend nearly halfway across the bay eastward from the southern point of Bernera Island, keep near its eastern shore.

**The coast** of Lismore from Bernera toward its northeastern point is rocky, steep-to, and without off-lying shoals; there are beaches of sand and gravel at Sailean and at Castle Port, where boats may be hauled up. There is an old castle in ruins close to the shore at Castle Port.

**Port na Morlach**, a bay near the northern point of Lismore, sheltered by Dubh Sgeir and Eilean Loch Osgar, two off-lying islets, affords shelter except from winds between west and southwest, which when strong throw a heavy swell into the bay. The western entrance is deep and clear, but a sunken rock lies 100 yards off the southwestern end of Dubh Sgeir. There are narrow passages between the islands, and eastward of the eastern end of Osgar, but they are encumbered with rocks and require local knowledge.

**Anchorage.**—The best position is in about 7 fathoms (12.8 m.), clay, in the southeastern corner of the bay 300 yards offshore.

**Port Ramsay**, at the northeastern end of Lismore, is small but well sheltered, and with local knowledge is available for small vessels. It is also frequented by coasting vessels to ship lime. The entrance to the anchorage is 200 yards wide at low water, but there are 5 fathoms (9.1 m.) in mid-channel, and from 3 to 5 fathoms (5.5 to 9.1 m.), good holding ground, at the anchorage.

**Lismore Island—Southeast coast.**—The southeast coast of Lismore from its southwestern end trends northeastward for  $8\frac{1}{2}$  miles and is steep-to 200 yards offshore for  $6\frac{1}{2}$  miles of that distance. Here a bank of gravel and stones extends 250 yards, or about 100 yards outside Sgeir a Dun, a small rock dry at high water. There are 5 fathoms (9.1 m.) close outside the bank.

**Lobster Stone**, nearly 300 yards from the shore, 1,300 yards farther northeastward and abreast of Appin Rock, dries 1 foot (0.3 m.), and foul ground extends more than 100 yards outside it. The coast from Sgier a Dun to Rudha na Aird ( $56^{\circ} 34' N.$ ,  $5^{\circ} 26' W.$ ), the northeastern point of the island, is fringed with a rocky flat extending from 200 to 400 yards offshore.

Caution is necessary to avoid this flat, especially when turning through the narrow channel between the Lobster Stone and the red light buoy off Appin Rock.

**The Lynn of Lorn**, lying between Lismore and the mainland southeastward of it, is an extension northeastward of the Firth of Lorn. Northward of Lismore, it and the Lynn of Morven, on the northwestern side of the island, unite in Loch Linnhe. The Lynn of Lorn is  $1\frac{1}{2}$  miles wide between the island and Rudha Fion, on the mainland, its southeastern entrance point, but it gradually narrows to the northeastward to 1 mile abreast of the entrance to Loch Creran and to less than  $\frac{1}{2}$  mile northeastward of that loch.

Several islands and shoals lie in the channel, but the water is generally deep until the narrows at its northeastern end are approached. Here both shores are encumbered by shallows, and the channels are narrow, with from 3 to 5 fathoms (5.5 to 9.1 m.).

**Greag Islands** are 2 groups of 2 and 3 islands, respectively. Greag Island, situated about  $1\frac{1}{2}$  miles westward of Rudha Fion, and the highest and southwestern of the islands, is 136 feet (41.5 m.) high, and is joined to Pladda Island, about 100 yards eastward of it, by a rocky causeway dry at low water. The two islands together occupy an area of 650 yards length, east and west, and 300 yards broad; they are steep-to except on the eastern side of Pladda, where a rocky spur extends nearly 200 yards.

Black Island, Cloch Eilean, and Stirk Island, about 800 yards northward of Greag and Pladda, are connected by shoal water; and extend 1,600 yards east and west. Cams Rock, which covers, lies midway between the groups.

There is a good channel 400 yards wide between Stirk, the northwestern island, and Lismore, but generally vessels should pass southward of the group; on no account should an attempt be made to pass between the islands.

**Eilean Dubh**, situated  $2\frac{1}{2}$  miles northeastward of the Greag Islands, and nearly in mid-channel between Lismore and the mainland, is nearly  $\frac{1}{2}$  mile long, northeast and southwest, 200 yards broad, and 153 feet (46.6 m.) high. Shoal water, on which is a cluster of rocks, extends about 400 yards northwestward of the island, with a channel 500 yards wide between the shoal and Lismore, and the navigable channel between the island and Eriska Shoal, extending from the mainland, is 900 yards wide, with depths of from 12 to 25 fathoms (21.9 to 45.7 m.).

**Branra Rock** lies 1,200 yards northeastward of Eilean Dubh and midway between Eriska and Lismore; it dries 6 feet (1.8 m.) is about 70 yards across, and steep-to.

**Beacon.**—An openwork iron beacon, 18 feet (5.5 m.) high, painted red and black in horizontal bands and surmounted by a barrel-shaped cage, stands on Branra Rock.

**Rudha Fion** is the southern extremity of a small promontory of the mainland eastward of the Greag Islands, and is the southeastern entrance point of the Lynn of Lorn. A rocky spur, terminating in a small patch with 5 feet (1.5 m.) water, extends over 200 yards westward from the point. The southeastern extremity of Shuna just open northwestward of Clach Toll, a flat-topped hill near Appin, 26°, leads northwestward of the shoal, which should not, however, be approached within 400 yards or to a depth of less than 14 fathoms (25.6 m.).

The southeastern shore of the Lynn of Lorn trends northeastward from Rudha Fion to the entrance to Loch Creran, a distance of  $3\frac{3}{4}$  miles, and is steep to until abreast of Sheamallie Farm, about 2 miles from the point. Eriska Shoal, of sand and stones, then commences, and gradually extends from the shore until it is nearly 400 yards wide opposite Eilean Dubh. Airds Bay Cottage in range with the northwestern side of Eilean Glas, 30°, leads northwestward of the shoal.

**Eilean Glas** (56° 32' N., 5° 26' W.), a small low rocky islet, lies near the entrance to Loch Creran,  $\frac{1}{2}$  mile eastward from Branra Rock, and  $\frac{1}{4}$  mile northwestward from the coast of Eriska Island, to which it is connected by a bar with from 2 to 3 fathoms (3.7 to 5.5 m.) of water.

**Loch Creran** is a winding inlet about 7 miles in length and very irregular in breadth; the entrance, immediately within Eilean Glas, lies between Eriska Island and the low rocky point of Rudha and Beith, the distance across being 350 yards at high water. Several rocks lie westward of Rudha and Beith, the outer one, which is nearly 200 yards in length and dries 10 feet (3.1 m.) being less than 200 yards from the rocks extending from the southern shore, to which it is connected by a bar with from  $2\frac{1}{2}$  to 3 fathoms (4.6 to 5.5 m.) water. The channel into the loch is over this bar.

Within the entrance narrows, the loch widens, but the shores are much indented. The sea reach lies east and west for about 1 mile; the loch then turns southward for  $1\frac{1}{2}$  miles, and thence it again trends eastward for about 3 miles to Crigan Narrows, where it is 100 yards wide. Above these narrows at the head of the loch is a basin extending  $1\frac{1}{4}$  miles eastward, with a width of about 800 yards.

The Creran River flows into the head of this basin, and at its mouth is a broad alluvial flat which dries.

A bridge of the Oban and Ballachulish branch of the Caledonian Railway crosses the Crigan Narrows at a height of 40 feet (12.2 m.) above high water.

**Depths.**—Within the bar, which has  $2\frac{1}{2}$  to 3 fathoms (4.6 to 5.5 m.) water, the depth in the fairway in the lower part of the loch is not less than 3 fathoms (5.5 m.) and generally from 5 to 10 and 14 fathoms (9.1 to 18.3 and 25.6 m.). In the wider part of the loch, southward of Ru Rabhach, there is a greatest depth of 27 fathoms (49.4 m.), decreasing to very regular depths of from 8 to 12 fathoms (14.6 to 21.9 m.) about 1 mile farther up. In Crigan Narrows there is a depth of from 1 to  $1\frac{1}{2}$  fathoms (1.8 to 2.7 m.), and in the basin above it 16 to 17 fathoms (29.3 to 31.1 m.) in the middle, decreasing to 5 fathoms (9.1 m.) about 100 yards offshore, except at its head.

**Directions.**—To enter Loch Creran approach the entrance with the first of the flood, passing on either side of Eilean Glas. Then bring Branra Beacon in range with the northern high-water mark of Eilean Glas, and keep it so until Airds Bay Cottage is its own breadth open northwestward of the outer high-water mark of Rudha and Beith, when keep a mid-channel course in the tidal current.

Close the eastern shore about North Shian Inn, off which is a rock, dry at high water; after passing this rock, bring it in range with the high-water mark of a point, having a small rock above high water off it near Woodhall, and keep this mark on through the channel, 400 yards wide, between the rocky spur of Sgeir Cailleach, running out from South Shian, and the ledges off the eastern shore.

**Anchorage.**—There is good anchorage ( $56^{\circ} 32' N.$ ,  $5^{\circ} 24' W.$ ) between Eriska and Sgeir Cailleach in from 5 to 7 fathoms (9.1 to 12.8 m.) about 300 yards from the shore.

**Tides and tidal currents.**—It is high water, full and change, at Crigan Narrows at 5h. 39m. The current runs in at the entrance to Loch Creran from  $5\frac{3}{4}$  hours after high water to  $\frac{1}{4}$  hour before the next high water; and it runs in through Crigan Narrows, at a rate of about 5 knots at springs, from  $5\frac{1}{2}$  hours before until  $\frac{1}{2}$  hour after high water, and outward, at a similar rate, from  $\frac{1}{2}$  hour after high water until  $5\frac{1}{2}$  hours before the next high water.

**Airds Bay** is the bight between Rudha an Beith, the low rocky northern entrance point of Loch Creran, and Ru nan Clach toll, a small rocky promontory rising to table-land extending to the village of Appin, and remarkable from a natural arch near the point. The bay is sheltered, except from southerly winds, and affords anchorage suitable for waiting tide with good holding ground in from 5 to 7 fathoms (9.1 to 12.8 m.), out of the tidal currents.

**Appin Rock**, which dries 6 feet (1.8 m.), is the outer rock of a ledge extending 400 yards westward from Ru nan Clach toll. Caution is necessary when in the vicinity of the ledge, as both ebb and flood currents set across it.

**Light buoy.**—A red conical light buoy, showing a flashing white light, is moored on the outer end of the ledge, about 100 yards north-westward of Appin Rock.

**Appin Pier.**—A wooden pier, 300 feet in length, extends into a depth of 11 feet (3.4 m.) at low water from the northwestern side of Clach toll promontory, about 800 yards from its southwestern end, and  $\frac{1}{4}$  mile westward of Appin Village. Mail steamers between Oban and Fort William call here to land and embark passengers and goods.

A little eastward of the pier is a stone slip, used by the ferryboat plying between Appin and the northeastern end of Lismore, 1,200 yards distant.

**Tides.**—It is high water, full and change, at Appin at 5h. 26m.; springs rise  $12\frac{1}{4}$  feet, neaps  $8\frac{1}{2}$  feet; neaps range 5 feet.

**Sgeir Buidhe** is one of a cluster of rocks 600 yards in length lying parallel with the shore, and about 200 yards off the salient northern point of Appin Bay. The low-water line extends in a nearly straight line northeastward from Appin Pier to these rocks; it then continues northeastward across the entrance to Loch Lathaich on to Knap Point in Shuna Sound; the average distance from the mainland being 500 yards, and the same from Castle Stalker, a picturesque ruin standing on a low grassy islet at the entrance to Loch Lathaich.

The ground, within the low-water line, which dries, is gravel, mixed with stones and boulders, the outer edge having a belt of fine sand.

**Light.**—A fixed white light, with red sector, 24 feet (7.3 m.) above water, visible 9 miles, is shown from a white tower on Sgeir Buidhe. The light is unwatched.

**Sgeir nan Tom** ( $56^{\circ} 34' N.$ ,  $5^{\circ} 27' W.$ ), 1,600 yards northwestward of Rudha na Aird and the northernmost islet of a scattered group northward of Lismore, is about 150 yards long northeast and southwest, and 15 feet (4.6 m.) high. Guilean Rock, which dries 7 feet (2.1 m.), lies about 200 yards southwestward of it.

**Grey Islet**, 12 feet (3.7 m.) high, is the northeasternmost of this group, and lies about 1,600 yards westward of the southern point of Shuna. A rock which dries 5 feet (1.5 m.) lies about 200 yards eastward from it and does not show when covered during still water.



A  $2\frac{1}{2}$ -fathom (4.6 m.) spot lies at the end of a bank with 4 to  $4\frac{1}{2}$  fathoms (7.3 to 8.2 m.) extending 400 yards southwestward from Grey Islet.

The cots on Knap Point in range with the southern high-water line of Shuna Island leads northward, but close to the shoal water off the rock and the outer end of Appin Pier in range with the eastern end of Sheep Isle  $181^\circ$ , leads close eastward of it.

**Sand Isles** consist of three rocks connected at low water, the northernmost of which is 13 feet (4 m.) high, lie 600 yards south-eastward of Sgeir nan Tom, and are about 400 yards in length, with foul ground extending 200 yards on their northwestern side and to half that distance on their southeastern side. The channel between Sand Isles and Sgeir nan Tom is 1,250 yards wide with depths of 6 to 17 fathoms (11 to 31.1 m.) water in it.

**Bogha na dubhan** is a shoal patch with less than 6 feet (1.8 m.) water, lying midway between Sand Isles and Rudha na Aird. It lies on a bank with  $1\frac{3}{4}$  to 5 fathoms (3.2 to 9.1 m.) extending 700 yards northeastward from the foul ground off Eilean Ramsay, and there are 4 to 8 fathoms (7.3 to 14.6 m.) water between it and the Sand Isles.

**Sheep Isle**, 600 yards long northeast and southwest, lies southward of Grey Islet, and is locally known for its lime works, the lime being shipped in a small bay on its southern side, where the vessels ground at low water. A low-water bank of shingle and bowlders runs out about 200 yards from its southeastern side. The isle is connected with Inn Isle, between which and the northern point of Lismore is a narrow channel with from 2 to 4 fathoms (3.7 to 7.3 m.), which should only be taken by small vessels and with local knowledge.

About 300 yards northward from the eastern end of Sheep Isle is a cluster of rocks which dries 4 feet (1.2 m.); the channel between them and the isle having a depth of one fathom (1.8 m.).

**Inn Isle Rock**, though detached from Inn Isle, is the termination of the foul ground extending nearly  $\frac{1}{4}$  miles southwestward from that isle; the rock is 200 yards long and dries 9 feet (2.7 m.) at low water; its position is nearly always noticeable.

**Tidal currents.**—The tidal current in the Lynn of Lorn are generally weak. In the wide area between Lismore and Kerrera Islands, although the currents set fairly through the Lynn, their rate does not exceed 1 knot at springs, the northeast-going current beginning about  $4\frac{1}{2}$  hours after high water and the southwest-going current about  $1\frac{1}{2}$  hours before high water.

Near Appin the northeast-going current begins  $5\frac{3}{4}$  hours after high water and the southwest-going  $\frac{1}{4}$  hour before high water.

The rate of the currents from midway between the Greag Islands and Rudha Fion to the Appin narrows is 2 knots at springs.

In the area between the Greag Islands and the southern entrance to the Sound of Mull there is an eddy, during the northeast-going current in the Lynn of Lorn, setting southwestward along the southeastern coast of Lismore, so that here a southwest-going current is constant, and this current turns sharply round Eilean Musdile into the Lynn of Morven while the north-going current is running between Lismore and Mull, or unites with the southeast-going current from the Lynn or Morven while that current is running toward the Firth of Lorn. The rate of the eddy current along the coast of Lismore from the Greag Islands is about  $1\frac{1}{2}$  to 2 knots at springs.

**The Lynn of Morven** is an arm of the sea between Lismore and the coast of Morven, northeastward from Rudha and Ridire to the ruins of Glen Sanda Castle ( $56^{\circ} 34' \text{ N.}, 5^{\circ} 32' \text{ W.}$ ), a square building on a conical rocky hill, 133 feet (40.5 m.) high, close to the sea, and on the northeastern side of Glen Sanda River. The Lynn is about 2 miles wide, and in mid-channel abreast of Bernera Island there are depths of over 100 fathoms (182.9 m.) shoaling to 44 and 36 fathoms (80.5 to 65.8 m.) farther eastward.

The coast of Morven is bold, rocky, and steep-to, and rises a short distance inland to the Morven hills, a range attaining a height of 1,679 feet (511.7 m.). Camus Eigneg, Toranach, and Cronaig Bays are slight indentations on the coast, but they should only be used for very temporary anchorage in fine weather.

**Loch Linnhe.**—The northwestern shore of Loch Linnhe, northeastward from Glen Sanda River, and that of Loch Aber, its continuation to the northeast, rises to an almost continuous range of mountains more or less precipitous, attaining in Ben na Cille a height of 2,152 feet (655.9 m.). Some deep valleys penetrate the range.

Loch Linnhe extends 13 miles northeastward from between Glen Sanda and the northern end of Lismore to the narrows of Corran, which connect Loch Linnhe to Loch Aber. The average width of the loch is from  $2\frac{1}{2}$  to 2 miles, but it narrows considerably toward its head, where Loch Leven branches off to the eastward.

**The southeastern shore.**—**Shuna Island**, nearly 1 mile northeastward of Sheep Isle, is 1.1 miles long northeast and southwest, about  $\frac{1}{2}$  mile wide, and rises to a table-topped hill, 239 feet (72.8 m.) high, near the northeastern end. The island, devoted to pasture, has on its southwestern side a white farmhouse, and near its southern point are the ruins of Shuna Castle, a small square building.

Cairn Rock ( $56^{\circ} 35' \text{ N.}, 5^{\circ} 24' \text{ W.}$ ), awash at low-water springs, lies 100 yards offshore westward of Shuna Farmhouse, and close

northwestward of it is a small patch with 3 feet (0.9 m.) water; foul rocky ground extends 300 yards from the shore in the vicinity of these rocks; the southern part of Shuna is also foul to the same distance.

**Shuna Sound**, between Shuna and the mainland of Appin, is nearly 800 yards wide at its northeastern end, but its southwestern part is contracted to less than 400 yards by Knap Point. A bar of shingle and rocks, with from 3 to 4 feet (0.9 to 1.2 m.) water stretches across the southwestern entrance. The sound is used by the Highland steamers at high water, but it requires local knowledge. Appin House, in range with Knap Point bearing  $43^\circ$ , leads over the bar.

With a strong southerly wind, anchorage may be obtained in Shuna Sound midway between Knap Point and the island, in 5 or 6 fathoms (9.1 to 11 m.) water, and, with even more shelter, in Shuna Cove, within Knap Point, in 5 to 7 fathoms (9.1 to 12.8 m.) water, good holding ground.

**Tidal currents.**—The currents northward of Appin become weak and split on Shuna Island, one part passing outside that island and the other inside through Shuna Sound. The northeast-going current runs through the sound at a rate of 1 knot from  $5\frac{3}{4}$  hours after high water to  $\frac{1}{4}$  hour before the next high water, and the southwest-going current at a rate of  $\frac{3}{4}$  knot from  $\frac{1}{4}$  hour before to  $5\frac{3}{4}$  hours after high water. With the northeast-going current there is slack water to the northward of Shuna Island.

**Eilean baile Ghobhain**,  $2\frac{1}{2}$  miles northeastward of Shuna, is  $\frac{1}{2}$  mile in length and 123 feet (37.5 m.) high near its southwestern end; a rock, which dries 2 feet (0.6 m.), lies 150 yards off its northern point, and shoal water of less than 5 fathoms (9.1 m.) extends northeastward 600 yards from this point. Shelter from westerly winds may be obtained on the eastern side of the island in a small bay.

**Rudha More** is a low rocky point, 1,500 yards northward from Eilean baile Ghobhain, with a good passage between, the deepest water being near the point. Cul Bay, to the southeastward of the point, affords shelter from northerly and easterly winds; anchor in 6 fathoms (11 m.) off a white fishing house on the shore; here is a good salmon fishery.

The shore from Rudha More trends northeastward and is rocky and almost steep-to for  $\frac{3}{4}$  mile, then a flat of rocks and boulders, dry at low water, commences, which extends 200 yards and closes the shore near Leachnasgeir farm. The northwestern side of Eilean baile Ghobhain, open northwestward of Rudha More, leads northwestward of this flat. Farther eastward is the small bight, Port

na Cloich, with a white two-storied house on its shores, and from thence for  $1\frac{1}{4}$  miles northeastward the extensive low-water flats along the low grassy shore require an offing of at least  $\frac{1}{4}$  mile.

**Kentallen Bay** ( $56^{\circ} 40' N.$ ,  $5^{\circ} 15' W.$ ) is a snug little cove about 400 yards deep and 200 yards broad, with anchorage in from 8 to 10 fathoms (14.6 to 18.3 m.), during fine weather for very small vessels. It is open to northerly winds, and in westerly gales the wind blowing against the high land of Ben Bheithir is deflected in violent squalls from all directions.

**Pier.**—Kentallen Pier, with from 17 to 26 feet (5.2 to 7.9 m.) of water at its head, is situated 600 yards northeastward of Kentallen Bay. Steamers between Oban and Fort William call here.

Kentallen Railway Station, on the Oban and Ballachulish Branch of the Caledonian Railway, is situated at the inner end of the pier.

**Lights.**—Two fixed red range lights, visible 4 miles, are exhibited from the pier.

**Rocks.**—A rock, with 6 feet (1.8 m.) water, lies 120 yards westward from the pier, and 200 yards northward from the pier is a patch of  $4\frac{1}{2}$  fathoms (8.2 m.).

The shore from Kentallen Pier trends northeastward 1,800 yards to Lettermore Point; it is steep-to at the distance of about 100 yards.

**Sgeir nan Ron** (Rock of the Seals) is a small rock which dries 10 feet (3.1 m.), lying  $1\frac{1}{2}$  miles northeastward of Kentallen Bay and 100 yards off Lettermore Point, with which it is connected at low water.

**Buoy.**—A red conical buoy is moored in 6 fathoms (11 m.) 100 yards northwestward of Sgeir nan Ron.

**Culchenna Point** ( $56^{\circ} 42' N.$ ,  $5^{\circ} 15' W.$ ), the southeastern entrance point of the approach to Corran Narrows, lies  $1\frac{1}{2}$  miles northwestward of Sgeir nan Ron.

**Culchenna Spit**, of sand and stones, extends 1.2 miles southwestward from Culchenna Point within the 5-fathom (9.1 m.) curve; it dries out 400 yards from the point, and then for about 1,600 yards has depths of from  $\frac{1}{2}$  to 2 fathoms (0.9 to 3.7 m.), with  $3\frac{1}{4}$  to 4 fathoms (5.9 to 7.3 m.) on its outer part.

**Light buoy.**—A red conical light buoy, exhibiting a flashing white light, is moored in 4 fathoms (7.3 m.) on the southern end of the spit.

**Shoal.**—A patch of 5 fathoms (9.1 m.), rock, with from 7 to 10 fathoms (12.8 to 18.3 m.) around, lies 1,800 yards  $183^{\circ}$  from Culchenna Point.

**Clearing marks.**—Corran Point Lighthouse in range with Ben Trislaig, 1,527 feet (465.4 m.) high, near the head of Loch Aber,  $25^{\circ}$ , leads westward of Culchenna Spit, but if the mountain be not visible,

do not bring the lighthouse northward of  $26^{\circ}$ . Loch Leven Hotel, just open northward of Lettermore Point,  $82^{\circ}$ , leads southward of the spit, and also of the 5-fathom (9.1 m.) patch.

**Northwestern shore.**—Loch Corrie, on the northwestern shore of Loch Linnhe northward of the northern end of Lismore, is nearly  $\frac{1}{4}$  mile wide at its entrance, and extends 1 mile northwestward, with general depths of from 16 to 7 fathoms (29.3 to 12.8 m.). There is a narrow shoal bank, with from 3 feet to 3 fathoms (0.9 to 5.5 m.) of water, at the head of the loch, and a rock, with 8 feet (2.4 m.) water, lies on its outer part 200 yards southward from a boat-house. This loch affords good shelter, but it is subject to violent squalls which sweep down the glens between the high land.

The whole loch is available for anchorage, but the best position is in the western corner near the head, in 7 to 8 fathoms (12.8 to 14.6 m.), mud, and good holding ground.

**Camus na Croish** is a bight formed between Ceann More, the northeastern point of Loch Corrie, and Rudha Maodalach, 1,400 yards farther eastward. The Skerries, a rocky spur, extends 150 yards off Ceann More; and from the head of the bay the low-water line extends nearly 400 yards. The bay affords temporary anchorage in fine weather in depths of from 7 to 11 fathoms (12.8 to 20.1 m.), mud.

**Kilmaliu (Chil Mhalieu) Bay.**—About 3 miles eastward of Loch Corrie is Rudha na Hearba, the eastern point of Kilmaliu (Chil Mhalieu) Bay, which affords good anchorage with northerly winds. The northeastern point of Eilean baile Ghobhain must be kept open of Rudha na Hearba, as the low-water line extends 350 yards off the head of the bay; its limit is marked by a small rock, above water, lying on its outer edge 400 yards inside Rudha na Hearba.

**Sgeir nan Gillea** ( $56^{\circ} 38' N.$ ,  $5^{\circ} 25' W.$ ), 100 yards in extent and 5 feet (1.5 m.) high, lies nearly 400 yards southward from Rudha na Hearba; there is a passage with from 6 to 9 fathoms (11 to 16.5 m.) between the rock and the point.

**Sgeir na Torran.**—The shore from Rudha na Hearba trends northeastward  $5\frac{1}{4}$  miles to Salachan Bay, and is quite clear and steep-to for nearly  $1\frac{1}{2}$  miles, where Sgeir na Torran, a cluster of rocks, two being above high water and the other one drying 7 feet (2.1 m.) extends 400 yards offshore. About  $\frac{1}{4}$  mile farther eastward and the same distance offshore is a rock which covers at high water. There is deep water close outside these rocks, and Rudha Maodalach open southward of Rudha na Hearba, leads southward of them.

**Sanda Shoal.**—Sanda Bay,  $3\frac{1}{4}$  miles from Rudha na Hearba, is a slight bend in the shore, with the low-water line extending off

400 yards. Sanda Shoal, 400 yards long east and west, and 200 yards broad, lies  $\frac{1}{2}$  mile eastward from the southwestern point of Sanda Bay, and has from  $1\frac{1}{4}$  to 2 fathoms (2.3 to 3.7 m.) water, gravel bottom. There are depths of 9 and 10 fathoms (16.5 and 18.3 m.) between it and the shore near Sgeir Sanda, and the passage between it and Ghearraidh Bank, to the northward, has depths of from  $4\frac{1}{2}$  to 5 fathoms (8.2 to 9.1 m.) water.

**Buoy.**—A black can buoy is moored in  $3\frac{3}{4}$  fathoms (6.9 m.) on the southeastern side of Sanda Shoal.

Corran Point Lighthouse in range with the beacon on Salachan Point,  $49^\circ$ , leads southward of Sanda Shoal.

**Ghearraidh Bank** extends along the shore from Sanda Bay eastward to Rudha Ruadh, the western point of Salachan Bay, a distance of about  $1\frac{1}{4}$  miles, the 2-fathom (3.7 m.) curve extending 700 yards offshore in places. A narrow sandy ridge, with 1 foot (0.3 m.) water, extends a distance of 1,300 yards along this bank; it commences off Rudha a Ghearraidh at a patch of bowlders which dries 2 feet (0.6 m.) and between the ridge and the shore the depth varies from 3 feet to 1 fathom (0.9 to 1.8 m.).

**Red Patch**, a detached bank of rock and gravel, about 200 yards in extent, with a depth of from  $1\frac{1}{4}$  to  $2\frac{3}{4}$  fathoms (2.3 to 5 m.) lies 700 yards east-southeastward from Rudha Ruadh. There are depths of from 7 to 14 fathoms (12.8 to 25.6 m.) close to on the outside, and a narrow 6-fathom (11 m.) channel between it and the shoal water extending from the shore.

**Salachan Bay** lies between Rudha Ruadh and Salachan Point,  $1\frac{1}{4}$  miles to the eastward; the Gour River, discharging into the head of the bay, forms extensive flats.

Sgeir Dubh, the outer of three small islets, at the edge of the low-water line in the northwestern part of the bay, is 9 feet (2.7 m.) high.

At 250 yards southward of Sgeir Dubh is a rocky patch, with 1 fathom (1.8 m.) water, about 30 yards in extent, close to the edge of the 5-fathom (9.1 m.) curve.

**Anchorage.**—Temporary anchorage may be obtained in about 8 fathoms (14.6 m.) a little inside the line joining Sgeir Dubh and Salachan Point.

**Salachan Point** ( $56^\circ 42' N.$ ,  $5^\circ 17' W.$ ) is a low boggy promontory surrounded by a shoal of large bowlders, which dries, and depths of less than 3 fathoms (5.5 m.) extend 600 yards southward from it.

**Beacon.**—On the southeastern end of Salachan Point is an octagonal beacon 32 feet (9.8 m.) high, painted red and white in horizontal bands, but it is not very noticeable against the land.

**Clovulin Flat.**—The shore from Salachan Point to Corran Point, a distance of nearly 2 miles northeastward, is fronted by shoal water, and from the head of Clovulin Bay, the slight indentation between these points, the 3-fathom (5.5 m.) curve extends 800 yards from the shore, the intervening depths being from  $\frac{1}{2}$  to  $2\frac{1}{2}$  fathoms (0.9 to 4.6 m.) the whole bank being named Clovulin Flat. Abreast of the vicinity of Culchenna Point the 5-fathom (9.1 m.) curve extends southeastward nearly 500 yards from the 3-fathom (5.5 m.) curve.

**Buoys.**—Two black can buoys are moored in about 5 fathoms (9.1 m.) on the outer edge of Clovulin Flat. The northern buoy is situated 850 yards  $210^\circ$  and the southern buoy 2,200 yards  $209^\circ$  from Corran Point Lighthouse, the latter is group flashing white. Between the southern buoy and Culchenna Point the channel is 400 yards in width.

Small vessels from the southward, not wishing to take the narrows during the ebb current, may anchor in fine weather off Clovulin Flat on the line between the two black buoys, out of the strength of the current.

**Corran Point Light.**—A fixed light with red and white sectors, 38 feet (11.6 m.) above water, visible 11 miles, is shown from a white tower, 42 feet (12.8 m.) high, on Corran Point, the low tongue of shingle on the northern shore of Corran Narrows.

**Corran Narrows.**—The southeastern shore from Culchenna Point trends northward, forming a bay, 1,700 yards to a point, whence it turns a little to the eastward, leaving Corran Narrows, a passage 300 yards wide, between it and Corran Point. There are depths of from 6 to 14 fathoms (11 to 25.6 m.) in the navigable channel, which is 200 yards wide through the narrows, except just below the lighthouse, where a rocky ledge with from  $4\frac{3}{4}$  to 5 fathoms (8.7 to 9.1 m.) water extends a few yards from the northwestern side.

**Directions.**—Approach the narrows from the southward, with Corran Point Lighthouse in range with Ben Trislaig, 1,527 feet (465.4 m.) high, near the head of Loch Aber, bearing  $25^\circ$ , which leads in mid-channel up to the northern of the two black buoys. Should Ben Trislaig be obscured, approach with the lighthouse bearing  $25^\circ$ . When about 300 yards distant from the northern buoy steer direct through the fairway of the narrows. It is necessary to guard against sudden swirls in the narrows. Large vessels should only pass through at and a short time after high water by day.

**At night.**—Steer for a position nearly  $\frac{1}{2}$  mile northwestward of Culchenna Spit light buoy, then steer  $29^\circ$ , keeping on the line dividing the red and white sectors of Corran Point Light until near

the southern black buoy of Clovulin Flat, when make a direct course to and through the narrows.

**Tidal currents.**—In the Lynn of Morven and Loch Linnhe the northeast-going current begins about  $5\frac{3}{4}$  hours before high water and the southwest-going current begins about  $\frac{1}{4}$  hour after high water, the general rate of the currents being from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  knots.

The current setting northeastward through the Lynn of Morven runs at first on the northwestern side of the Lynn, along the coast of Morven, but is deflected from that shore over toward the northeastern end of Lismore, Dubh Sgeir, and Eilean Loch Osgar, where it runs at the rate of  $2\frac{1}{2}$  knots at springs. It then continues up the middle of Loch Linnhe, between Rudha na Hearba and Eilean baile Ghobhain, but sends an eddy current southwestward along the northwestern shore from Rudha na Hearba across the mouth of Loch Corrie.

Near the entrance to the Lynn of Morven ( $56^{\circ} 30' N.$ ,  $5^{\circ} 37' W.$ ), the southwest-going current passing outside Bernera Island forms an eddy setting northeastward into Bernera Bay, but the main part of the southwest-going current outside Bernera takes a westerly direction, and meeting the southeast-going current from the Sound of Mull is turned southward and forms a strong tide rip halfway across the entrance to the Lynn of Morven. In the tide rip the current sometimes attains a rate of 4 knots at springs.

There is an area of slack water during the northeast-going current northeastward of Lismore Island. Near Rudha More the rate of the northeast-going current is about  $\frac{3}{4}$  knot at springs; about 2 miles above Rudha More, off Ardsheil, the current divides into 2 parts, one of which sets, as a very weak current, eastward into Ballachulish Bay, and the other part sets east-northeastward toward Corran Narrows.

At about 1 mile southwestward of Corran Narrows the northeast-going current runs from 5 hours before high water until about high water, and the southwest-going current from about high water to 5 hours before the next high water. During the southwest-going current an eddy sets over Clovulin Flat in Clovulin Bay and northeastward along the shore, but its rate is small; there is a similar eddy in the bay between Culchenna Point and Corran Narrows. There is also an eddy in Salachan Bay during the southwest-going current.

**In Corran Narrows** it is high water, full and change, at 5h. 47m.; springs rise  $13\frac{1}{4}$  feet, neaps  $8\frac{3}{4}$  feet.

The tidal currents run at a rate of about 4 to  $5\frac{1}{2}$  knots at springs and 2 knots at neaps, slack water occurring about the time of high



and low water, and lasting for about 10 minutes at springs and 45 minutes at neaps. Slack water may be expected at high and low water, and the currents will run through the narrows into Loch Aber from about low until high water, and out from Loch Aber through the narrows from about high until low water. When the current is opposed by a strong wind there is a heavy race and overfall in the narrows. The rate of the currents is greatly affected by freshets in the upper lochs.

**Loch Aber** extends about 8 miles northeastward from Corran Narrows, with an average breadth of  $\frac{3}{4}$  mile. At its head it turns abruptly northward and northwestward, and passing through Annat Narrows leads into Loch Eil. Within Corran Narrows a mountainous ridge rises close to the shore on each side; Ben na Cille ( $56^{\circ} 44' \text{ N.}$ ,  $5^{\circ} 18' \text{ W.}$ ), 2,390 feet (728.5 m.) high, about  $1\frac{3}{4}$  miles northwestward from Corran Point, is the summit on the northwestern shore, and there is a waterfall about halfway down its southern slope.

The loch attains its greatest depth of 85 fathoms (155.5 m.) in mid-channel about  $3\frac{1}{2}$  miles above Corran Point, whence the depth gradually decreases to 32 fathoms (58.5 m.) opposite Fort William.

The entrance to the Caledonian Canal is near the head of the loch, about  $1\frac{1}{2}$  miles above Fort William.

A good road runs along the southeastern shore of the loch and a fair road along its northern shore.

**Corran Pier**, on the northeastern side of Corran Point, is a wooden structure with depths of from 10 to 13 feet (3.1 to 4 m.) at its outer end. Mail steamers between Oban and Fort William call here, and a ferry plies between a jetty close to the pier and a jetty on the opposite side of the narrows.

**Corran Shoal** ( $56^{\circ} 44' \text{ N.}$ ,  $5^{\circ} 15' \text{ W.}$ ), which lies off Corran Pier, is somewhat triangular in shape and about 400 yards in extent. The shoal has a least depth of  $\frac{1}{2}$  fathom (0.9 m.), rock and gravel. A gully, with a depth of 4 to  $4\frac{1}{2}$  fathoms (7.3 to 8.2 m.) separates it from a spit of  $1\frac{1}{2}$  to 3 fathoms (2.7 to 5.5 m.), extending off the southwestern shore.

**Buoys.**—A spherical buoy, painted black and white in horizontal bands, and surmounted by a staff and diamond, is moored in  $4\frac{1}{4}$  fathoms (7.8 m.) on the eastern side of the spit extending off the southwestern shore.

A spherical buoy, painted red and white in horizontal bands, with a staff and triangle, is moored in  $3\frac{1}{2}$  fathoms (6.4 m.) near the eastern end of Corran Shoal.

A red conical buoy is moored in  $5\frac{1}{2}$  fathoms (10.1 m.) on the western end of Corran Shoal.

Culchenna Point, well open of Corran Lighthouse, leads south-eastward of the shoal.

**Anchorage.**—There is good anchorage for a small vessel within Corran Shoal in about 9 fathoms (16.5 m.), with the lighthouse showing between Corran Point and Ardgour Hotel, and a little southeastward of the line between the post office and the western (red) buoy.

Camus Asaig, the bight northwestward of Corran Shoal, affords better anchorage in from 10 to 12 fathoms (18.3 to 21.9 m.), mud and shells, with the manse bearing  $240^{\circ}$  and the red buoy  $130^{\circ}$ ; here the tidal currents are scarcely felt, and with southerly and southwesterly winds there is good shelter, but in northwesterly gales squalls come down off the high land of Ben na Cille with violence from all directions. The anchorage in Inver Scadle Bay is then preferable.

**Northwestern shore—Inver Scadle Bay.**—The northwestern shore of Loch Aber from Camus Asaig trends northeastward  $1\frac{1}{2}$  miles to Ru Dearg (south), and is rocky and steep-to. Inver Scadle Bay lies northeastward of Ru Dearg (south), and the Scadle River, which flows into it, has nearly filled the bay with silt. Sgeir More, a small rocky patch awash at high water, marks the edge of the low-water line. The boathouse on Rudha na h Airde is conspicuous. Cunaglen House, the seat of Earl Morton, stands among the trees a mile inland.

**Anchorage.**—There is anchorage in the southwestern part of Inver Scadle Bay about 300 yards offshore and 200 yards from the low-water line, in about 8 to 10 fathoms (14.6 to 18.3 m.), with Corran Point Lighthouse a little open of Ru Dearg (south) and the boathouse open southeastward of Sgeir More.

A bank with 5 fathoms (9.1 m.) of water, stony bottom and unsuitable for anchorage, extends about 500 yards southeastward from Sgeir More, but farther northeastward about 400 yards offshore, and inside Victorious Rock, there is good sheltered anchorage, except from southeasterly winds.

Apparently anchorage water extends along the shore for nearly  $1\frac{1}{2}$  miles northeastward of Sgeir More, but this locality has not been closely examined, and it should be used with great caution as there may be some unknown rocky patches.

**Victorious Rock** ( $56^{\circ} 46' N.$ ,  $5^{\circ} 13' W.$ ), 600 yards  $100^{\circ}$  from the boathouse on Rudha na h Airde, is a patch about 30 yards in extent with  $2\frac{3}{4}$  fathoms (5 m.) of water, from which a rocky bank, with from  $3\frac{3}{4}$  to  $4\frac{1}{4}$  fathoms (6.9 to 7.8 m.), extends westward 100 yards. The 20-fathom (36.6 m.) curve is about 100 yards, and the 50-fathom (91.4 m.) curve 200 yards, southeastward of the rock.

**Shoal.**—A detached patch of rocky ground about 200 yards in extent, with  $3\frac{1}{2}$  fathoms (6.4 m.) least water and 6 and 7 fathoms (11 and 12.8 m.) between it and the shore, lies 300 yards off the northwestern shore, nearly  $1\frac{1}{2}$  miles from Sgeir More. Kiel Farm House open of Ru Dearg (south) leads southeastward of the shoal. Thence to Camus nan Gall, a distance of  $3\frac{1}{4}$  miles, the shore is bold and approachable to 200 yards.

**Camus nan Gall**, at the head of Loch Aber, on its northwestern shore, and just above Fort William on the opposite side, though small, affords good anchorage in from 5 to 7 fathoms (9.1 to 12.8 m.), the southern point of the bay giving protection from the short heavy sea experienced in the loch during southwesterly gales.

**Shoal.**—A small rocky shoal, with  $4\frac{2}{3}$  fathoms (8.5 m.) over it at low water, lies 150 yards offshore, and just outside the 5-fathom (9.1 m.) curve, in the southern approach to Camus nan Gall; it is situated 1,060 yards,  $316^\circ$ , from the spire of the Episcopal Church in Fort William.

**Ru Dearg (north).**—Ru Dearg (north) is the northern extremity of the northwestern shore of the loch.

Less than 200 yards eastward of Ru Dearg (north), and connected to it by a narrow tongue of sand and gravel, lies a small flat grassy islet, 8 feet (2.4 m.) high. A drying bank of stones, which projects in a southerly direction for a distance of 200 yards from the south side, surrounds the islet.

**Shoal.**—Southward of the bank of stones and separated from it by a narrow passage, is a rocky shoal, the eastern extremity of which is near the middle of the channel and narrows the fairway to about 300 yards; the western extremity projects into Camus nan Gall. The two shallowest spots are named McLean Rock and New Rock, and there are depths on other parts of the shoal varying from 8 to 18 feet (2.4 to 5.5 m.).

**New Rock**, with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, lies in Camus nan Gall 300 yards southward of Eilean no Creich.

**Buoy.**—A black pillar buoy, surmounted by a ball, is moored in 3 fathoms (5.5 m.) on its northern side.

**McLean Rock**, which is just covered at low water, lies 100 yards eastward of New Rock.

**Buoy.**—A black can buoy is moored in  $3\frac{3}{4}$  fathoms (6.9 m.) on its southeastern side.

**Southeastern shore.**—**Black Rock**, opposite Inver Scadle Bay, and 250 yards off the southeastern shore of Loch Aber, is awash at high water. At low water it is about 100 yards long, with deep water close outside it and from 3 to 2 fathoms (5.5 to 3.7 m.) between it and the shore.

About 300 yards southwestward of Black Rock and 750 yards offshore is a detached rocky patch with  $1\frac{3}{4}$  fathoms (3.2 m.) of water. To clear Black Rock and this patch, do not approach the shore in their vicinity within a  $\frac{1}{4}$  mile. At night do not enter the red sector of Curran Point Light.

From Black Rock northeastward the shore is steep-to at the distance of 100 yards until near the mouth of Ciachinnis River, off which a low-water bank extends 300 yards; thence the shore to Primrose Bank, nearly  $\frac{1}{2}$  mile southward of Fort William, is bold at the distance of 200 yards.

**Fort William** ( $56^{\circ} 49' N.$ ,  $5^{\circ} 07' W.$ ), a small town near the head of Loch Aber, derived its name from a fort built during the Highland Rebellion. It extends about  $\frac{1}{2}$  mile along the shore southwestward of the fort. The population was 1,913 in 1921. The fort stands on a gravelly spit. Its eastern side overlooks the rapid stream of the Nevis River, which forms a good natural barrier, and at high water on its northern and northwestern sides are the waters of Loch Aber. Ben Nevis, 4,400 feet (1,341.1 m.) high, is situated  $3\frac{1}{2}$  miles southeastward of the fort, and the ruins of Inverlochry Castle are on the southern side of the Lochy River, about 1 mile northeastward of the fort.

The spire of the Episcopal Church and the chimneys of the Glerlochry and Nevis distilleries, northward of the town, are conspicuous.

There are two piers near the southwestern end of the town with depths of 4 to 8 feet (1.2 to 2.4 m.) alongside them.

**Light.**—A fixed white light, 17 feet (5.2 m.) above water, visible 5 miles, is shown from the pier at Fort William. An additional white light is exhibited when a steamer is expected.

**Anchorage.**—There is good holding ground: mud and clay, in from 4 to 8 fathoms (7.3 to 14.6 m.) of water, about 300 yards westward from the pier, but the edge of the bank is very steep. During southwesterly gales a heavy sea, to which this anchorage is open, sets up the loch. It is then advisable to obtain shelter in Camus nan Gall.

**Communication.**—Fort William is on the North British Railroad. Mail steamers run daily (Sundays excepted) between Oban and Fort William. A ferry crosses to Camus nan Gall.

**Lochy Flat** extends from about Fort William Pier to the entrance to the Caledonian Canal at Corpach, embracing the mouths of the Lochy and Nevis Rivers, which flow into Loch Aber within about 400 yards from each other. The flat is sand, with occasional patches of shingle, and its low-water edge is 600 yards distant from the shore of the bay between Fort William and Corpach, gradually becoming less toward the entrance to the Caledonian Canal.

An Coal, a narrow low islet formed of bowlders, about 600 yards long in a north-northeast and south-southwest direction, lies on the flats. It is 4 feet (1.2 m.) high near its southern end and 2 feet (0.7 m.) at the northern end, in other parts it is awash.

**Buoys.**—A conical buoy, painted red, and surmounted by a black staff and globe, is moored on the edge of the flat close to the south point of the entrance to the Lochy River through the flats.

A red conical buoy is moored on the edge of the flat at 900 yards northward of the entrance. A similar red buoy is moored 1,450 yards northward of the entrance.

**Corpach Islets.**—The three islets at the head of Loch Aber are named—from east to west—Eilean na Creich, or Driftwood Islet, 4 feet (1.2 m.) high; Eilean a' Bhealaidh, or Broom Islet, 7 feet (2.1 m.) high; and Eilean nan Craobh, or Tree Islet, 12 feet (3.7 m.) high. The two first-named are low and grassy, and situated in mid-channel; they stand on a bank of stones, by which they are surrounded to a distance of from 100 to 150 yards.

Eilean nan Craobh, the westernmost of the three, is flat, and has two trees on it; it stands on a stony bank, which, in conjunction with the stony bank to the eastward, narrows the fairways.

**Buoy.**—A black can buoy is moored near the northeastern edge of the shoal water off Eilean na Creich, on the southwestern side of the channel leading to the entrance of the Caledonian Canal.

**Shoal.**—A small rocky shoal, with a least depth of 29 feet (8.8 m.) over it, is situated north-northeastward of Eilean a' Bhealaidh, and faces the entrance to the Caledonian Canal.

**Rock.**—A small rocky patch, with  $5\frac{1}{2}$  feet (1.7 m.) at low water, is situated southward of Eilean nan Craobh, on the edge of the bank on the southern side of the channel.

**The village of Corpach** has a very picturesque appearance from the loch; its origin is principally due to this spot, having been selected as the western entrance to Caledonian Canal. The pier used by the Highland steamers is on the northern side of the canal entrance and may be approached by them at low water.

**Light.**—A fixed light showing red, except between the buoys eastward of it, where it is white, is exhibited from the end of the northern of the two piers at entrance to the canal.

**Tidal currents.**—The northeast-going current through Corran Narrows follows the southeastern shore of Loch Aber, but its rate rapidly decreases to  $\frac{3}{4}$  knot 2 miles northeastward of the narrows. Near Ru Dearg (south), the current on the southeastern shore turns, at about three hours before high water, toward and down the northwestern shore at a rate of about  $\frac{1}{2}$  knot, so that along the northwestern shore from Ru Dearg (south), the current sets southwest-

ward for about 10 or 11 hours, especially around Camus Asaig, where it turns southward and its rate increases to  $1\frac{1}{2}$  knots. This south-going current meets the northeast-going current into Loch Aber just above the lighthouse, and causes swirls which must be guarded against, or joins the current running out of the loch. The northeast-going current is felt in Camus Asaig only for about one hour, from about one-half to one and one-half hours after high water.

In Loch Aber above Ru Dearg (south), the currents are weak, and their rate and direction depend almost entirely on the freshets.

Northeastward of Ru Dearg (north) the flood current splits, one current flowing close around the north side of Ru Dearg (north), and to the southward of Corpach Islets; the other, flowing northward of these islets, joins the southern current in Annat Narrows.

The main ebb current from Loch Eil runs in an easterly direction southward of Corpach Islets; a lesser current runs between Eilean a' Bhealaidh and Eilean nan Craobh, and joins the main current northeastward of Ru Dearg (north), causing strong eddies in that vicinity during spring tides and heavy freshets.

At the entrance to the Caledonian Canal the rate of the currents is  $2\frac{1}{2}$  knots at springs. The influence of the freshets is indicated by the fact that the surface water near Fort William is frequently fresh enough to be drinkable.

**Directions.**—From abreast Fort William vessels proceeding to Corpach should steer to pass between the red conical buoy on the flats at the entrance to Lochy River and the  $4\frac{3}{4}$ -fathom (8.7 m.) shoal northeastward of Rudha Mor. Then pass close eastward of the black can buoy marking McLean Rock and southwestward of the two red conical buoys on the edge of Lochy Flats, and northeastward of the black can buoy marking the northern edge of the shoal depths off Eilean na Creich, and as necessary toward the entrance of the canal.

**Caution.**—When traversing this channel on an ebb tide the vessels should be kept well clear of Lochy Flats, as the tidal current running southward of Corpach Islets trends toward the flats.

**The Caledonian Canal**,  $52\frac{1}{2}$  miles in length, extends from Corpach, at the northern end of Loch Linnhe, in a northeasterly direction to Clachnaharry (near Inverness), where it opens into Beaully Basin, at the southwestern end of Inverness Firth.

The canalized portion of the canal has a total length of 21 miles, the remainder of it being formed by Lochs Lochy, Oich, and Ness, which are  $8\frac{1}{2}$ ,  $3\frac{1}{2}$ , and  $19\frac{1}{2}$  miles in length, respectively.

Owing to its many sinuosities and to the size of the locks, the canal is not navigable for vessels above 160 feet long and 38 feet beam, the draft of which exceeds 15 feet in fresh water.

It affords a navigable channel between the opposite sides of Scotland, and the route by it is some 350 miles shorter than that through the Little and North Minch and Pentland Firth, where the navigation is intricate and the weather often stormy.

The passage from sea to sea may be performed generally in two days; under adverse circumstances of wind and weather during the short daylight of winter, it may take a few days.

While time and fuel are undoubtedly saved in making the passage through the canal and avoiding the dangerous navigation of the Pentland Firth during the prevalence of bad weather, the slow speed necessary for the negotiation of the constant bends and narrow bridgeways of the canal renders its employment on other occasions of doubtful value. In fine weather, practically no time is saved even by a vessel with a speed of from 8 to 9 knots.

The canal, from its entrance at Corpach, runs almost parallel with the Lochy River for a distance of about 8 miles into Loch Lochy. The navigation passes through Loch Lochy ( $56^{\circ} 58' N.$ ,  $4^{\circ} 54' W.$ ), a distance of  $8\frac{1}{2}$  miles, and from the northeastern end of this loch a canal,  $1\frac{3}{4}$  miles long, extends into Loch Oich. This loch is  $3\frac{1}{2}$  miles in length, and from its northeastern end a canal continues to Loch Ness, a distance of  $5\frac{1}{2}$  miles. Loch Ness is  $19\frac{1}{2}$  miles in length, and the water in it is deep, in places attaining a depth of 129 fathoms (235.9 m.). From the northeastern end of Loch Ness, the route passes through Loch Dochfour, and by canal to Clachnaharry, near Inverness, a distance of  $6\frac{3}{4}$  miles.

The medium width of the surface of the canal is 110 feet, and of the bottom 40 feet, its least depth being 15 feet (4.6 m.) The rise to Loch Lochy is 90 feet and to Loch Ness 48 feet, but the highest level of the canal, about 100 feet above high water ordinary neaps, is in the locks joining Lochs Lochy and Oich.

**Locks.**—There are 29 locks in the canal, 15 of which are situated in the western half of the canal, as follows:

*Corpach.*—One sea lock and two inner locks.

*Banavie.*—Eight locks.

*Gairlochy.*—Two locks.

*Laggan.*—Two locks.

The remaining 14 locks are in the eastern half and are situated as follows:

*Cullochy.*—One lock.

*Kytra.*—One lock.

*Fort Augustus.*—Five locks.

*Dochgarroch.*—One lock.

*Muirtown.*—Four locks.

*Clachnaharry.*—One lock and one sea lock.

Of these locks 15 are used in the ascent from or descent to the southwestern end, there being a flight of 8 locks, rising 64 feet, at Banavie, about a mile within the entrance at Corpach, which is known as Neptune's Staircase; and 14 in that from the northeastern end.

The locks are 170 feet long and 40 feet broad. The gates and sluices are all worked by hand, and it takes about 14 minutes to pass a vessel through each lock. To facilitate working the locks by night acetylene flares are supplied. For instructions regarding entering locks see paragraph "Directions," sections 6 and 7.

**Bridges.**—The canal is crossed by eight swing road bridges and three swing railroad bridges at various points. Vessels must blow their whistle when approaching the bridges at Moy, Laggan, Aberchaldier, and Tomanhurich, so as to warn the bridge keeper of their approach, and must reduce speed or stop until the bridge has been swung clear of the channel. As the piers between these four bridges are narrow, care must be taken in passing through them. Between 10 p. m. and 6 a. m. these four bridges are kept open for canal traffic to pass.

The remainder of the bridges cross the canal at the various locks and are opened as necessary by the lock keepers for vessels to pass them.

**Pilots.**—Pilotage is not compulsory, but it is advisable and the pilot certificate of qualification and conduct from the canal commission should be seen.

**Traffic.**—Sailing vessels and boats can sail through with a fair wind or can be towed by steamers, or tracked by horses or men. Tugs are available at reasonable charges at either end. The necessary expenses are confined to the canal dues, and tables of the tonnage rates and regulations can be had at the collector's office on entering the canal; or on application to the superintendent of the Caledonian Canal, Clachnaharry, Inverness, who will also furnish any further information required.

The navigation is principally used by the regular line of steam vessels plying between Glasgow and Inverness, and carrying general merchandise and passengers; by passenger steam vessels; by steam and sailing fishing vessels; by steam and sailing vessels carrying grain, timber, alumina, aluminium, coal, slates, and manures; and by yachts, etc.

Vessels should anchor and communicate with the canal officials before entering the canal.

**Lights.**—There are lights at Corpach, Mucomir, Kilfinnan Point, Fort Augustus and Bona Ferry.



**Light buoys.**—There are two conical light buoys southwestward of Bona Ferry, one on each side of the channel, that on the northwest side, painted red, exhibiting a flashing red light, that on the southeast side, painted black, exhibiting a fixed white light.

**Buoys and beacons.**—The navigable channel is marked by buoys, posts, beacons, and cairns. All navigational marks on the northwest side of the channel are painted red. Those on the southeast side of the channel are painted black.

**Dangerous bends.**—In the canal there are several dangerous bends, situated as follows:

Three in the western reach between Banavie and Moy Bridge.

One immediately north of Moy Bridge.

One at the north end of Laggan Avenue.

One at the north of Fort Augustus Reach.

One round the foot of Torvaine.

In the approach to all these bends notice boards are placed on the canal banks, facing up and down the channel, bearing the word "Whistle" painted on them in luminous paint. All vessels must blow one prolonged blast on their whistle on approaching these bends, and reduce speed to "Dead slow," and are not to increase their speed until they have passed the similar notice board at the other end of each bend.

There are further special instructions for vessels proceeding round the bends in Laggan Avenue and at Torvaine, which will be found under the heading of "Directions," section 24.

**Anchorage.**—The following anchorages may be used by vessels requiring shelter:

**Loch Lochy.**—Close off the south shore of Achnacarry Bay. Just north of the pier on the northern shore of Achnacarry Bay.

**Loch Oich.**—Off Port Macdonnell Pier, southwest of Eilean Drynachan, and to the west of the channel.

**Loch Ness.**—Close off Invermoriston Pier. In Foyers Bay. Urquhart Bay, close under and northwest of Urquhart Castle on the south side, and close to Temple Pier on the north side of the bay. In Dores Bay.

**Caution.**—As the depths near the shore in Loch Lochy and Loch Ness do not decrease to a sufficient depth for anchoring until the shore is approached close to, the anchorages in these lochs must be used with caution and the lead must be kept going when approaching them.

Bollards are placed at some points to enable vessels to warp round the bends, or by which to haul the vessel off should she take the ground on the bank, and it is advisable to have a boat towing, ready with lines for immediate use on such occasion. Little damage is

done by grounding, as the bottom is soft, and the banks are faced with stone for only a short distance below the usual water level.

**Communications.**—There are post offices at Corpach, Gairloch Lock, Fort Augustus, Dochgarreh Lock, and Muirtown. All the locks are connected by telephone to each other and to Inverness and Corpach.

**Directions.**—West to east—By day—Corpach to Gairloch.—The sea lock at Corpach may be entered for 4 hours on either side of high water during spring tides, and at most states of the tide during neaps, depending on the draft of the vessel. There are 22 feet (6.7 m.) over the sill at M. H. W. S. and 12 feet (3.7 m.) at M. L. W. S.

The locks are not worked at night nor on Sundays unless a special order is given.

The following signals are exhibited at the pierheads of the sea locks at Corpach and Clachnaharry:

By day.—“Clear way,” blue burgee. “Entrance prohibited,” blue burgee over a ball.

By night.—“Clear way,” two green lights vertical. “Entrance prohibited,” two red lights vertical.

During the time the “entrance prohibited” signal is showing no vessel is to approach close to the sea locks or pierheads.

At Corpach, when leaving, it is necessary to keep a spring on the jetty in order to swing into the channel. The flood tide there is a strong set to the southward into shoal water.

From Corpach a small basin leads to two locks, which lift the vessel into the canal proper, both banks of which are here built up. This reach,  $\frac{3}{4}$  mile in length, leads to Banavie's Locks, eight in number, which are generally known as Neptune's Staircase. After leaving Banavie the vessel passes through the western reach of the canal, which extends for  $5\frac{1}{4}$  miles to Gairloch.

**Caution.**—There are three dangerous bends in this reach, situated  $\frac{3}{4}$ ,  $1\frac{1}{4}$ , and 3 miles, respectively, from Banavie; they are marked by “whistle” boards, and the vessel must sound a prolonged blast on her whistle and reduce speed to “dead slow” before entering them, and is not to increase speed until she has passed the “whistle” board at the other end of each bend.

Four miles from Banavie, Moy Bridge crosses the canal; the vessel's whistle must be sounded on approaching it, in order that it may be swung clear of the channel.

As the channel between the bridge piers is narrow, and there is a dangerous bend immediately beyond the bridge, speed must be reduced to “dead slow” until the vessel has passed the “whistle” board at the far end of this bend.

One and a quarter miles from Moy Bridge is Gairlochy, a small village close to the south end of Loch Lochy, where there are two locks separated by a small basin; 400 yards southwest of the lock a small shoal extends into the canal from the northwest bank. A red buoy is placed on the edge of it, and the vessel must pass to the southward of it.

**Loch Lochy—Gairlochy to Laggan Locks.**—From Gairlochy the canal takes a sharp bend to the northward round Reach Point, on which there is a red post. The vessel must keep in the center of the channel and pass into Loch Lochy between Mucomir Post Light and the signal post on the southeast bank and the red buoy abreast of it.

**Caution.**—West-going vessels approaching the canal entrance here must remain in the southern part of Loch Lochy, clear of the fairway, if the signal arm on the post near Mucomir Light is up, or the red light showing, and may only enter the canal when the arm is dropped or the green light is shown. West-going vessels must also be careful not to mistake the entrance to Mucomir Weir at the south end of Loch Lochy, 200 yards east of Mucomir Light, for the canal entrance; there is a notice board on piles in the middle of the entrance to the weir with the words "no passage" painted on it.

After passing Mucomir Light the vessel is in Loch Lochy, which is deep and clear of outlying dangers. The vessel may then proceed at full speed, passing close to the southward of the red cask buoy off Coille Ras Point. When this buoy is abeam alter course to  $39^{\circ}$ ; this course will take the vessel up the center of the loch to Ceann Loch Bank,  $7\frac{3}{4}$  miles from Mucomir Light. There is a black cask buoy off Invergloy Point, 3 miles from Mucomir Light, marking the end of a shoal spit off this point; the vessel must pass to the northward of this buoy.

At the north end of the Loch Lochy the channel becomes narrow. The vessel must pass close northwestward of the light post and the two black posts, one on either side of it, on Ceann Loch Bank, then between the black post, 400 yards northeast of this light and the red cask buoy 120 yards south of Kilfinnan Point Light, then close to Kilfinnan Point, on which is a red light post and a red iron perch. When Kilfinnan Point is abeam alter course to the northward and pass between Laggan Pier and the black post abreast of it, and steer straight for Laggan Locks.

**Laggan Locks to Laggan Drawbridge (Loch Oich).**—Laggan Locks, two in number, are the last ascending locks in the canal. After leaving the locks the canal leads into Laggan Avenue, 400 yards from Laggan Locks; in this avenue the canal banks are high and covered with fir trees, and the vessel must keep a good lookout while passing through it. At the north end of the avenue there

is a sharp bend to the northward, and on the southeast bank here, facing down the canal, is a signal post to control the east-going traffic, and a "whistle" board.

**Caution.**—East-going vessels must not pass this signal post if the arm is up or the red light is showing, but must stop and keep close in to the southeast bank, and may not proceed farther until the signal arm is dropped or the green light shown.

The vessel must proceed round this bend at "dead slow" speed, blowing the whistle on approaching it, and again when rounding it, as Laggan Drawbridge lies only a short distance beyond the bend. The channel through this bridge leads the vessel into Loch Oich.

West-going vessels in the southern part of Loch Oich must not enter the canal at Laggan Drawbridge if a red flag or a red light is hoisted there, but must wait in the offing, clear of the fairway, until a green flag or a green light is shown.

**Loch Oich—Laggan Drawbridge to Aberchalder Bridge.**—Loch Oich,  $3\frac{1}{2}$  miles long, is narrow and dotted with islands. As the channel in parts of it is very narrow, and leads between islands and shoals, it must be navigated with caution.

From Laggan Drawbridge steer for the black cairn at Ardrishaig, passing northwest of the black post, 300 yards northeast of the bridge and between Ardishaig Cairn and the three red buoys off it. Then alter course to the northward and steer for Creag Liath Cairn, which is painted red, passing close southeastward of it; then pass between the black buoy off Ash Tree Point and the red buoy abreast it, and between Rudha Ard Nan Uan Cairn and the red buoy off it. Then pass Eilean Na H'Ealaidh (an islet 1 foot (0.3 m.) high with a few trees on it) and the black cask buoy off it.

Then steer to pass between Eilean Fada (a long narrow island, 1 foot (0.3 m.) high, with tall trees on it; its northwest side is built up and its two extremities are marked by a black post, on each of which is a board with "slow" on it) and the red cask buoy marking the northwest side of the channel abreast it.

**Caution.**—Vessel must reduce speed to "dead slow" when passing the black post on the extremities of Eilean Fada. Care must also be taken if the River Barry is swollen, to pass close to the red buoy the black post on the extremities of Eilean Fada. Care must also be taken off Leitirfearn Cairn, as the stream from this river strikes the vessel's bow and tends to swing her on to the cairn and the shoal water southwest of it.

Pass between the Leitirfearn Cairn, painted black, and the red cask buoy off it; then steer to pass between the red cairn on the southeast side of Eilean Drynachan (an islet 1 foot (0.3 m.) high, with four small trees on it) and the black buoy off it.

From Eilean Drynachan steer to pass close northwestward of the black buoy just southwest of Aberchalder Point, and pass between that point and the two red posts guarding the Oich Weir, after passing which the vessel is again in the canal. The vessel must then blow her whistle in order to have Aberchalder Bridge opened.

**Aberchalder Bridge to Fort Augustus.**—From Aberchalder Bridge the canal leads for  $\frac{1}{3}$  mile to Cullochy Lock, the first descending lock. After passing this lock the canal leads to the northward, and at about  $\frac{1}{2}$  mile from Cullochy it takes a bend to the eastward into a reach called Kytra Reach, which leads straight to Kytra Lock. Half a mile from this bend the southeast bank of the canal opens out into a lagoon, on the canal edge of which is Cairn Island, a low narrow island, almost awash, with trees on it; a cairn, which only just shows above water, is situated 70 yards northeast of the northern extremity of this island. In this part of the reach a vessel should keep close to the northwest bank. After passing Kytra Lock the canal leads straight for  $\frac{1}{4}$  mile, and abreast Kytra Cairn, which must be passed by east-going vessels on the starboard hand, the channel bends to the northward, and is nearly straight for about 1 mile; this part is called Fort Augustus Reach.

**Caution.**—East of Kytra Cairn there is a backwater, which must not be mistaken for the canal by west-going vessels, which in this vicinity must follow the trend of the northwest bank, passing Kytra Cairn on the port hand.

At a distance of 600 yards northeastward of Kytra Cairn, and on the southeast bank, is Coille Faillege, a small low wooded point.

At the north end of Fort Augustus Reach there is a dangerous bend. "Whistle" boards are placed on the northwest bank in the approach to it, and the vessel must sound her whistle and reduce speed to "dead slow" when near the board.

A short distance round the bend are the five locks at Fort Augustus. Should the vessel have to wait before she is passed into the locks, she should secure to the wharves near the lock entrance, keeping clear of the lock gates. The deepest water is alongside the wharf on the northwest bank, by the railroad bridge.

**Loch Ness—Fort Augustus to Bona.**—The five locks at Fort Augustus should be passed in about 50 minutes. Outside the lower lock gate the canal is crossed by a swing bridge, which must be opened before a vessel can enter or leave this lock. Steer in mid-channel for 400 yards and pass into Loch Ness between Inveroich Point, on which is a red post, and Lighthouse Point, on which is a white circular lighthouse with a red pointed roof. Loch Ness is deep and clear of outlying dangers.

The vessel can now proceed at full speed, steering  $42^\circ$  and pass 400 yards to the southward of Porthclair. When Porthclair is abeam

alter course to 36° and pass 500 yards northward of Foyers, and when it is abeam alter course to 32°, straight for Bona Lighthouse, a white building on the low shore at the northern end of the loch, showing a fixed white light.

Off Aldourie Castle, 800 yards southwestward of Bona Lighthouse, is a black cask buoy; the vessel must pass to the north of this buoy and then steer to pass between the red light buoy and the black light buoy, southwestward of and close to Bona Lighthouse, and when near them she must reduce speed to "dead slow" and blow one long blast on her whistle. When these two light buoys are abeam the vessel must steer for the black post off Bona Ferry.

**Caution.**—East-going vessels must wait to the southward of the two light buoys southwestward of Bona Lighthouse if other vessels are seen or heard approaching Bona from the east, and must not proceed farther until they have cleared these two light buoys.

**Bona Lighthouse to Dochgarroch Lock.**—When the black post with a board marked "SLOW" on it, just south of the Darroch Islands, is seen, the vessel must alter course to the northward and steer to pass between a line joining the two black posts and the northwest canal bank, care being taken not to get to the eastward of the line joining these posts, as the water is shallow to the westward.

When the northern black post is abeam the vessel can increase speed and steer to pass close to Dochfour Pier, passing to the northward of the black cask buoy close westward of the Darroch Islands.

**Caution.**—If a west-going vessel sees or hears an east-going vessel coming through the channel between Bona Lighthouse and the Darroch Islands she must wait near Dochfour Pier until that vessel has passed to the northward of the black post just south of Darroch Islands, and when the west-going vessel proceeds she must blow her whistle and reduce speed to "dead slow" until she enters Loch Ness between the two light buoys off Bona, when she may proceed at full speed.

When Dochfour Pier is abeam, steer to pass close to Dochfour Lodge Pier, passing to the southward of the three red cask buoys off the northwest bank, between these two piers, and to the northward of the black cask buoy off the west point of Cambuslochy Bay.

After passing the Lodge Pier, keep toward the northwest bank, so as to avoid being drawn into the Ness Weir, situated on the southeast bank, over which the surplus water from Loch Ness flows into the River Ness, and pass to the northward of the black post, situated abreast the ferry at the southwest end of the weir.

When the weir is passed, steer a mid-channel course between the canal banks to Dochgarroch Locks, which is a short distance farther on.

**Dochgarroch Lock to Clachnaharry.**—From Dochgarroch Lock the canal leads with several bends for  $2\frac{1}{2}$  miles to Torvaine, round the eastern end of which is a dangerous bend.

**Caution.**—A “whistle” board is placed at each end of this bend, and the instructions on them, as well as those laid down in articles Nos. 24 and 26 of the general traffic instructions for the canal, must be rigidly carried out.

Immediately after passing this bend the whistle must be blown to have the swing road bridge at Tomnahurich opened; having passed which the canal leads for 1 mile to Muirtown, where there are four connected locks. In the approach to these locks there are wharves on both banks of the canal, to which vessels may secure.

The Muirtown Locks, just below which the canal is crossed by a swing bridge, lead into Muirtown Basin, 25 acres in extent; at the southern end of the basin are wharves where vessels may load and discharge.

Should the vessel be proceeding to sea, she must pass through this basin, keeping to the southward of the small black mooring buoys which lie off the eastern bank, to Clachnaharry Lock, situated at the western end of the basin.

After passing this lock and the swing railway bridge westward of it, the vessel proceeds through a small basin to the sea lock, from which she is passed into Beaully Basin, at the southwest end of Inverness Firth.

The depth over the sill of the sea lock is 24 feet (7.3 m.) at M. H. W. S. and 12 feet (3.7 m.) at M. L. W. S.

Vessels entering or leaving the canal by the sea lock at Clachnaharry can usually do so for four hours on either side of high water during spring tides, and at nearly all stages of the tide during neaps, depending on the draft of the vessel.

The current runs very strongly across the entrance to the lock at Clachnaharry.

**General Traffic Instructions.**—1. Traffic within the canal limits will be regulated by the Admiralty port and canal officers in conjunction with the canal authorities.

2. No vessel shall obstruct the fairway in the approach to the sea locks at Corpach and Clachnaharry.

3. The following signals will be exhibited at the pierheads of the sea locks at Corpach and Clachnaharry:

By day.—“Clear way,” blue burgee. “Entrance prohibited,” blue burgee over a ball.

By night.—“Clear way,” two green lights vertical. “Entrance prohibited,” two red lights vertical.

During the time the “entrance prohibited” signal is showing no vessel is to approach close to the sea locks or pierheads.

4. No vessel shall anchor in any fairway or channel in the canal or in the approaches thereto, nor make fast to any guide post, buoy, or beacon.

5. Traffic shall keep to the right bank or starboard side of the channels and fairways.

6. Approaches to all locks are marked by notice boards instructing vessels to reduce their speed when 300 yards from the lock gates and to "stop engines" when 150 yards distant. These instructions must be rigidly obeyed, and on no account must vessels rely on their engines reversing, as various accidents have occurred through the neglect of this rule. No vessel shall enter any lock without having sufficient checking ropes ready to make fast ashore, and such ropes shall not be cast off prior to or when leaving the locks until ordered by the lock keeper. Should the vessel be out of control in the approach she must be stopped by being turned into the canal bank, so as to avoid breaking through the lock gates.

7. (a) Every vessel shall, on approaching any lock gates or bridges, give one long blast on her whistle, and shall not attempt to enter any lock or pass any bridge when a danger flag (red) by day and a danger light (red) by night are shown.

(b) All locks are protected by guard chains, and until these are lowered vessels must not proceed to enter the locks or the hull or propellers will be fouled by them.

(c) The "clear way" signal by day will be a green flag and by night a green light.

8. Vessels shall not move their engines after they have come to rest in any lock until authorized to do so by the lock keeper.

9. Every vessel shall, at the request of a head lock keeper, land as many men as can be spared to assist in working the lock gates.

10. Mooring and checking ropes are not to be made fast to bridges, lock gates, cranes, lamp-posts, trees, etc., but only to the posts, hooks, and bollards provided for the purpose.

11. No vessel shall be moored on the tracking path side of the canal except for the purpose of allowing traffic to pass or in the event of a breakdown.

All vessels lying at anchor moored to the canal bank or aground in the channels and reaches throughout the canal shall by day exhibit a black ball hoisted in such a way as to indicate on which side of the vessel the deepest water lies, and from sunset to sunrise shall exhibit a bright white light in a similar way, and shall also maintain a watch on deck, and all vessels under these conditions shall, during fog, mist, or snow, etc., ring a bell as required by the board of trade rules and regulations.



Vessels at anchor or moored to piers outside the above-mentioned limits shall show a ball at the forestay during the day and by night the lights required by the board of trade rules and regulations.

12. Vessels should not display any other lights than those required for ordinary navigation as laid down in the board of trade rules and regulations in the open waters of Loch Lochy and Loch Ness.

13. All vessels shall in all respects, except when otherwise provided for, follow the rules and regulations as laid down by the board of trade regulations for the rule of the road at sea.

14. Mooring ropes must not be laid across the fairway or channels.

15. British Government vessels, which will fly the white ensign by day and will burn bright headlights at night, shall have preference over all other traffic within the canal limits, and any privately owned vessel shall at once reduce speed and stop her engines, on being required to do so, to allow Admiralty traffic to pass.

16. Vessels meeting within the canal reaches and cuttings shall both slow their engines when they come within 100 yards of and until they have passed each other.

17. West-going vessels shall (except in the case of a tow) give way to east-going vessels, and shall reduce their speed, stop their engines, or get into the bank as necessary to give east-going traffic the right of way, and west-going vessels and vessels giving way to a tow shall at night under these conditions train their headlights eight points toward the nearest bank.

18. Should any vessel be unable to maintain her speed within the canal reaches and cuttings or channels, such vessel must allow an overtaking vessel to pass her and shall keep sufficiently to the left or port side of the channel and stop her engines or get into the bank, as necessary, to give such overtaking vessel the right of way.

19. The maximum speed of all vessels navigating the canal reaches and cuttings shall be 6 knots by day and 4 knots by night.

20. During fog or mist, etc., the speed of all vessels shall be reduced to a maximum of 4 knots, and all vessels under way under these weather conditions shall exhibit their navigation lights should the visibility be sufficiently low to render such course desirable.

21. Towing of vessel abreast of tow is under no circumstances permitted.

22. All vessels when approaching dredges, canal hoppers, other canal repairing craft, or vessels in tow, shall reduce speed and move slowly for a distance at least 100 yards on each side of the dredger, hopper, etc.

23. Every vessel shall, when approaching any of the "whistle" boards marking the dangerous bends in the canal, blow a long blast on her whistle, and reduce speed to "dead slow" until the "whistle" board at the other end of each bend is passed.

24. East-going vessels shall (a) when passing Dochfour Lodge Pier (Ness Weir), (b) when approaching Torvaine:

Give one prolonged blast on her siren, and no west-going vessel shall enter the section until the east-going vessel has cleared. Should, however, a west-going vessel be within either of these sections when an east-going vessel sounds her siren, she will answer with four short blasts, and the east-going vessel shall then wait for the west-going vessel to clear.

25. In the event of a breakdown occurring to any vessel in any of the canal cuttings, a messenger is to be dispatched to the nearest lock station with a report of the circumstances.

26. Should a vessel take the ground in any part of the reach at Torvaine, her engines must not again be moved without the sanction of the canal officers, to avoid the risk of disturbing the clay puddle. She must be refloated either by warping or with the assistance of another vessel.

27. No ashes or rubbish of any description is to be thrown overboard in any of the canal reaches or waters of the canal except within Loch Lochy or Loch Ness.

The use of rope and hazel-rod fenders by vessels within the canal limits is prohibited.

28. Every vessel, on arrival at Muirtown, shall obtain from the canal office, Clachnaharry, a pass bill, which must be delivered up on leaving the canal to the head sea-lock keeper at Corpach or at Clachnaharry, as the case may be.

**Tides.**—It is high water, full and change, at Corpach at 6h. 03m.; springs rise 12 feet, neaps  $8\frac{1}{4}$  feet; and at Kessock (near Clachnaharry) at 0h. 05m.; springs rise 14 feet, neaps 9 feet.

**Annat Narrows.**—Immediately westward of the Corpach Islets is the entrance to Annat Narrows ( $56^{\circ} 50' N.$ ,  $5^{\circ} 09' W.$ ), which lead into Loch Eil. The narrows trend northwestward and are about 1 mile in length, with an average breadth of 300 yards at high water, but the width of the navigable channel is less than 200 yards at low water; the least water in the fairway, which borders on the southern shore, is about  $2\frac{1}{2}$  fathoms (4.6 m.).

**Loch Eil**, from within Annat Narrows, trends westward nearly 6 miles to its head ( $56^{\circ} 51' N.$ ,  $5^{\circ} 20' W.$ ) at Drumfern, with an average breadth of about  $\frac{1}{2}$  mile. The loch is seldom frequented by vessels larger than gabarts, flat-bottomed craft which ship wood at

the head of the loch. Local pilots can be procured at Camus nan Gall, Corpach, and Fort William.

After passing through the narrows the loch opens out, and the 2-fathom (3.7 m.) curve extends nearly 300 yards from either shore for the distance of nearly  $\frac{1}{4}$  mile; further in the shores of the loch are generally steep to at the distance of 200 yards. The deepest water in Loch Eil is 38 fathoms (69.5 m.) in about mid-channel and 1,600 yards northwestward of Dorathy Stone, on the southwestern shore  $\frac{1}{2}$  mile within the narrows; the depths then gradually decrease toward the head of the loch, where the low-water flats dry out for some distance, especially at the mouth of Aibhinn River. Around the loch head there are depths of from 9 to 12 fathoms (16.5 to 21.9 m.) 200 yards from the low-water line.

On the northern side of the loch are the mansions of Achdaliue and Fassiefern. The Fort William and Mallaig branch of the North British Railway runs along the northern shore of the loch, and there are stations at Banavie, Corpach, Locheilside, and Glenfinnan.

**Tidal currents.**—The tidal currents run through Annat Narrows at a rate of 5 knots at Springs; the current running into Loch Eil from  $4\frac{3}{4}$  hours before until  $1\frac{1}{4}$  hours after high water, and running out of Loch Eil from  $1\frac{1}{4}$  hours after high water until  $4\frac{3}{4}$  hours before the next high water.

Within the narrows the in-going current follows the northern shore of Loch Eil, gradually decreasing in rate to 1 knot off Fassiefern, and to  $\frac{1}{2}$  knot at the head of the loch, where it is high water, full and change, at 6h. 27m.

**Ballachulish Bay.**—Onich Pier is situated 1,800 yards northeastward from Lettermore Point, and Ballachulish Bay extends eastward, from between the point and pier, 1 mile to the narrows of Loch Leven, and is about  $\frac{3}{4}$  mile wide.

It affords good anchorage for vessels of any size, and the scenery is very fine. The little village of Onich is situated near the pier, and houses are dotted along the northern shore of the bay to North Ballachulish on its eastern shore.

There is deep water along both the northern and southern shores of the bay outside a distance of 200 yards.

**Piers.**—Ballachulish Pier ( $56^{\circ} 41' N.$ ,  $5^{\circ} 12' W.$ ) extends into 14 feet (4.3 m.) water on the southern side of the bay, and Onich Pier into from 8 to 15 feet (2.4 to 4.6 m.) on the northern side.

**Shoals.**—At 300 yards northwestward from Ballachulish Pier and 130 yards from Currachd Liath (a large rock above water close to the shore) is a small stony shoal, with from 3 to 5 feet (0.9 to 1.5 m.) water, inside the 3-fathom (5.5 m.) curve.

A bank of stones and rock, with depths of from 6 to 10 fathoms (11 to 18.3 m.), lies about 300 yards offshore about 600 yards westward of Ballachulish Pier; it is bad holding ground.

Loch Leven Hotel in range with the Pap of Glencoe, bearing  $91^\circ$ , leads northward of the bank.

**Anchorage.**—Generally, large vessels anchor as convenient in Ballachulish Bay, in from 15 to 25 fathoms (27.4 to 45.7 m.), mud bottom, but in the middle of the bay westward of the narrows the tidal currents, especially the ebb, at springs are strong enough to render it advisable to moor.

The best anchorage in the bay in all winds is about 200 yards off Ballachulish Pier, in from 10 to 12 fathoms (18.3 to 21.9 m.), good holding ground of stiff mud, sand, and shells, and out of the tidal currents.

There is anchorage during fine weather in the northeastern corner of the bay off St. Bride's Church, holding ground of stiff mud, and with a good clean steep-to beach for landing. It is, however, open to southwesterly winds, which bring in a considerable lop, and with southerly winds heavy squalls come down off the mountains.

**Tides and tidal currents.**—It is high water, full and change, at Ballachulish Pier at 5h. 27 m.; springs rise  $13\frac{1}{4}$  feet, neaps  $8\frac{3}{4}$  feet; neaps range  $4\frac{1}{3}$  feet. Equinoctial springs rise another foot and fall the same amount below the datum. Winds blowing up Loch Linnhe raise the water, and those blowing down lower it.

The tidal currents in Ballachulish Bay are weak, but in the middle of the bay immediately westward of Loch Leven Narrows the outgoing current from the narrows causes a weak eddy setting eastward into the northeastern corner of the bay.

**Communication.**—Passenger steamers plying between Glasgow and Inverness call at Ballachulish and Onich Piers twice a week. The Oban and Ballachulish Branch of the Caledonian Railway runs along the southern side of the bay, Ballachulish Ferry Station being close to the narrows, and Ballachulish, the terminus, about 2 miles farther on.

There are post and telegraph offices at Ballachulish on the southern side of the narrows, at North Ballachulish, and at Onich.

**Supplies** can only be obtained locally to a very limited extent. Water can be procured at high water from numerous streams on the southern side of the bay when discharging freely after rain.

**Loch Leven Narrows** (Peter Strait) ( $56^\circ 41' N.$ ,  $5^\circ 11' W.$ ) extend southeastward nearly  $\frac{1}{2}$  mile, with a width of 200 yards between the high-water lines on either shore. Large low-water flats, formed by silt from the mountain streams, lie off the two low north-western entrance points, and between these flats is a bar, with from

1 to 2 fathoms (1.8 to 3.7 m.) of water, which rises suddenly from a depth of about 16 fathoms (29.3 m.) in the bay, and falls to depths of 3 and 4 fathoms (5.5 to 7.3 m.) in the middle of the narrows.

Loch Leven Hotel, on the northern side, and Ballachulish Hotel, a large building of gray stone, on the southern side of the narrows, are conspicuous from seaward.

**Peter's Stone**, or commonly Clach Mhic Pharaig (MacPatrick's Stone), nearly 300 yards above Ballachulish Hotel, close off the shore on the southern side of the narrows, dries 6 feet (1.8 m.); a sunken rock, with 3 feet (0.9 m.) water, lies 70 yards northwestward of it.

A ferry plies across the narrows.

**Ledge.**—A rocky ledge, with a rock awash at low water near its end, extends about 200 yards southeastward from the northern shore just within the narrows.

**Directions.**—Approach the narrows with a conspicuous white cottage, about 50 feet (15.2 m.) above the sea at Ballachulish Slate Quarries, a little open of Ru na Carnas, and proceed through in mid-channel. A sailing vessel must enter with the flood and leave with the ebb current. In going out it is necessary to keep near the southern shore in the main current, as a part of the ebb encircles the bay in which Port an Gunan is situated, and sets over the rocky ledge extending from the northern shore.

**Tidal currents.**—The tidal currents run through Loch Leven Narrows at a rate of 4 to  $5\frac{1}{2}$  knots at springs, and  $2\frac{1}{2}$  knots at neaps. Slack water occurs about 1 hour after high and low water. The in or southeast going current through the narrows runs from  $4\frac{3}{4}$  hours before to about three-fourths hour after high water, and the out or northwest going current through the narrows runs from  $1\frac{1}{4}$  hours after high water to about  $5\frac{1}{4}$  hours before the next high water. The currents are influenced by freshets.

**Loch Leven** is nearly 8 miles in length from Loch Leven Narrows, its entrance, to its head, and it is navigable by small vessels throughout. Inside the entrance the loch opens out into a small basin, and  $\frac{1}{2}$  mile farther in, Ru na Carnas, on the northern side, again contracts it to a second narrows, within which the loch widens out into a basin, about  $3\frac{3}{4}$  miles in length, with a greatest width of 1,800 yards. In this basin, which has general depths of from 10 to 30 fathoms (18.3 to 54.9 m.), there are several islets and rocks.

The inner narrows above the basin are 100 yards in width for a distance of about 700 yards; the loch then opens out to a width of about 300 yards to its head, a distance of  $2\frac{1}{4}$  miles.

**Port an Dunan** ( $56^{\circ} 41' N.$ ,  $5^{\circ} 10' W.$ ), a bight at the northern end of the basin immediately within the entrance narrows, affords anchorage for very small vessels in 2 fathoms (3.7 m.) of water.

The entrance to the port, rather more than 200 yards wide, is westward of Eilean Dun, but being encumbered with rocks local knowledge is necessary.

**Ru na Carnas** is a low green sloping point at the end of a raised beach; here the width of the loch is less than 400 yards, but the channel is narrowed to 150 yards by low-water banks on either shore.

**Eilean Choinich**, a low, flat, green island, 20 feet (6.1 m.) high and nearly 200 yards in extent, lies 450 yards eastward of Ru na Carnas; it is fringed by boulders, which extend on the southern side for a distance of 60 yards, outside which the water deepens suddenly to 10 fathoms (18.3 m.). Between the island and Ru na Carnas, shoal water extends more than halfway from the island, leaving along the point a narrow gut with from  $2\frac{1}{2}$  to 5 fathoms (4.6 to 9.1 m.), where vessels occasionally hold on for a tide.

Inside Eilean Choinich to the northward, though there is a clear space with moderate depth of water and good holding ground, the entrance is difficult on account of a sunken ledge extending 400 yards from the eastern side of the island, and a detached patch, with one foot (0.3 m.) water, distant 300 yards from Ru ard an Darraich on the northern shore.

**Sgeir an Dubh** is a rocky spur running out 150 yards from the northern shore, 700 yards eastward of Ru ard an Darraich; with this exception the northern shore may be approached to 100 yards, as far as the inner narrows of Loch Leven.

The channel southward of Eilean Choinich is about  $\frac{1}{4}$  mile wide, deep, and clear, and the southern shore, thence to a pier 700 yards beyond the slate quarries, is clear, except between Ru na Glaistig, and the point to the westward, where a steep low-water flat fills up the indentation to a line joining the two points.

Ballachulish Slate Quarries are on the southern shore of the loch, 2 miles from the entrance, the workings being carried on at the western foot of Maol Dubh. A deep artificial harbor has been formed by the débris from the workings, thrown out from two points in a northerly direction; here vessels lie alongside wharves and ship cargoes of slate.

**St. Mungo Island** ( $56^{\circ} 41' N.$ ,  $5^{\circ} 08' W.$ ), nearly 400 yards distant from the quarry harbor points, and 750 yards from the northern shore, is about 200 yards in extent and 39 feet (11.9 m.) high; it has been used as a burial ground from ancient times; the ruins of a chapel still stand near its western end. This island is the westernmost of a group of islets and rocks, connected with each other at low water, 600 yards in extent east and west, and occupying a central position in the large basin on the loch. There are two detached rocks in the vicinity of this group; one just covers at high

water springs, and lies about 140 yards southward of the middle of the group; the other has 4 feet (1.2 m.) of water, and is 200 yards from the middle of the St. Mungo group in the line between it and the slate quarries pier. The southern point of Eilean Choinich open of St. Mungo Island, 273°, leads southward, and Callort Lodge in range with the eastern end of Eilean Choraig, 332°, leads eastward of this rock.

**Glencoe.**—The southern shore from the slate quarries pier forms a bay ending in the wooded point of Invercoe, 244 feet (74.4 m.) high, on which is a large house built by Lord Strathcona. The Coe River flows into the bay, but from the pier an extensive flat crosses the bay almost directly to Ivercoe Point, with an average breadth of 400 yards from high-water mark. The Pap of Glencoe, a conical mountain 2,433 feet (741.6 m.) high, forming the northern shoulder of Sgor coire Corr, 3,210 feet (978.4 m.) high, lies 1½ miles eastward from Invercoe Point.

Callort House, on the low ground near the northern shore opposite Ivercoe, is a conspicuous building of gray stone, situated in a wooded demesne; ½ mile westward of the house is the lodge, ½ mile eastward is Callort Cottage, a small villa building inclosed by a plantation.

At Ivercoe Point the loch is 530 yards wide with 27 fathoms (49.4 m.) in mid-channel; thence to the inner narrows of Loch Leven the distance is 2 miles, the intervening shores being steep and clear, and the hills on either side rising to a considerable height, in some cases precipitately.

**Camus a h'airidh**, a slight indention on the northern shore 1¼ miles eastward of Callort House, affords good anchorage in 9 fathoms (16.5 m.) about 200 yards offshore.

**Loch Leven Inner Narrows** (commonly known as the Dogs Ferry) (56° 42' N., 5° 03' W.) are 700 yards long and 30 yards wide. The tidal currents set through with a great rate at all times, the slack being of very short duration; sailing vessels must therefore go through the narrows with the current, and good local knowledge is necessary. The channel is dredged to a minimum of 11 feet (3.4 m.) at low-water ordinary springs.

**Lights.**—A flashing white light is shown at the southern side of the western end of the narrows, and a flashing red light is shown at the southern side of the eastern end of the narrows. Both lights are 12 feet (3.7 m.) above water and visible 5 miles.

**The shores** from the inner narrows to the head of the loch are clear of shoals and the central depths moderate, with the exception of a deep hole of 26 fathoms (47.5 m.) about ½ mile within the narrows. Anchorage may be obtained in Camus nam Bann, immediately

westward of Eilean Banna, a small low island with a solitary tree a little more than 1 mile from the loch head. The low-water line of this island extends off about 70 yards, but the southern shore of the loch abreast of it is steep-to.

There are a pier and a wharf at Kinlochleven, near the head of the loch. The former has a depth of 18 feet (5.5 m.) at the outer berth on its southern side, the latter has a depth of from 21 to 18 feet (6.4 to 5.5 m.) alongside. The pier and wharf are in constant use by vessels up to about 200 tons, employed by the British Aluminium Co., whose works are close by.

**Lights.**—Two fixed red lights are shown at Kinlochleven, one at the end of the jetty, the other on the northwest corner of the wharf.

**Tidal currents.**—In the large basin of the loch the tidal currents are weak; but at Loch Leven inner narrows the in-going current attains a rate of 6 knots at springs and  $2\frac{3}{4}$  knots at neaps, and the out-going of  $4\frac{1}{4}$  knots at springs and  $2\frac{1}{2}$  knots at neaps.

There is little or no slack water at springs. It is high water, full and change, at the inner narrows at 6h. 13m.

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## CHAPTER V

**WEST COAST OF THE ISLAND OF MULL, WITH LOCHS SCRIDAIN, NA KEAL, AND TUADH—ISLANDS OF TIREE AND COLL—SOUND OF MULL, WITH TOBERMORY HARBOR, AND LOCHS ALINE AND SUNART—THE COAST FROM ARDNAMURCHAN TO MALLAIG HARBOR, WITH LOCHS MOIDART, AILORT, AND NAN UAMH—THE SMALL ISLES**

**Island of Mull—West coast.**—The coast of the Island of Mull from the northeastern entrance point of Iona Sound turns sharply southeastward for about 3 miles to the entrance to Loch Lathaich, and it is rugged, rocky, and generally steep-to.

**North Bay,**  $\frac{1}{2}$  mile westward of Loch Lathaich, is a small inlet open to the northward, but coasting vessels load in it with granite.

**Loch Lathaich** extends about  $1\frac{1}{2}$  miles southward, with an average breadth of  $\frac{3}{4}$  mile. The western shore—which is the eastern boundary of granite—has depths of 5 fathoms (9.1 m.) from 200 to 300 yards off it; but several patches of foul rocky ground extend from 300 to nearly 400 yards off the eastern shore. At the southeastern end of the loch is a narrow inlet, 600 yards deep, which dries, and at its head is the small town of Bunessan.

There is a post and telegraph office at Bunessan, and the mail steamer from Oban calls three times a week.

**Eileanan Liathanach** (Grey Islands) are two small islets off the entrance to Loch Lathaich, which, including a rocky spur to the northwestward, extend northwest and southeast nearly 600 yards. A small rock, which dries at low water, lies 100 yards northeastward of the southern island.

Between Eileanan Liathanach and Rudha traigh Maorach, the western point of Loch Lathaich, is a clear deep passage  $\frac{1}{4}$  mile wide.

**Light.**—A flashing white light with red sector, 40 feet (12.2 m.) above water, visible 11 miles, is shown from a white beacon on the southeastern extremity of the eastern Liathanach Islet.

**Ionain Rock,** nearly 400 yards from the eastern shore and  $\frac{1}{4}$  mile southward of the eastern entrance point, is 150 yards across, and dries 9 $\frac{1}{2}$  feet (2.9 m.) at springs. The apex of Eilean nam Meann in range with Cnoc ant Suidhe, a hillock 145 feet (44.4 m.) high and close to the shore at the head of the loch, bearing 174°. leads westward of the rock.

**Eilean nam Meann** (Goat Island) occupies a central position in Loch Lathaich; there is a rock, with 6 feet (1.8 m.) water, 100 yards northward of it.

**Eilean Bhan** (White Island) ( $56^{\circ} 19' N.$ ,  $6^{\circ} 15' W.$ ), nearly 400 yards long, north and south, 200 yards broad, and 75 feet (22.9 m.) high, lies 300 yards southward of Eilean nam Meann.

The best anchorage in the loch is under Eilean Bhan, in from 4 to 5 fathoms (7.3 to 9.1 m.), mud, about midway between it and the shore to the southward.

**Tides.**—It is high water, full and change, at Bunessan, at 5h. 24 m.; springs rise 12 feet, neaps  $8\frac{1}{4}$  feet; neaps range  $4\frac{1}{2}$  feet.

**Loch Scridain** extends eastward about 8 miles, with an average breadth of  $1\frac{1}{4}$  miles from its entrance between Ard Tun, the small promontory on the eastern side of Loch Lathaich, and Ard Meadhonach to the northeastward. Its southern shore is fringed with rocks, some of which are off lying and sunken, but its northern shore is clear and steep-to, so the loch is available as a port of refuge, accessible during stormy weather.

**Depths.**—The general central depths in the loch eastward to Aird Kilfinichen are between 30 and 20 fathoms (54.9 and 36.6 m.), though to the southward of Dun Bhuirg there are depths of from 30 to 66 fathoms (54.9 to 120.7 m.) Within Aird Kilfinichen the water shoals gradually toward each shore from 20 fathoms (36.6 m.) to 15 and 7 fathoms (27.4 and 12.8 m.).

**Bogha More**, which dries 2 feet (0.6 m.), is one of several patches of rocks occupying a space of nearly 400 yards off the entrance to Kilpatrick Bay; the two outer patches are 300 yards apart, and have 6 feet (1.8 m.) least water. These rocks lie nearly 2 miles eastward of Loch Lathaich and immediately opposite and 1,800 yards distant from Garradh na Strorne, the northern point of entrance to Loch Scridain.

Meall na Carn in range with Ard Tun Point,  $271^{\circ}$ , leads northward of the rocks around Bogha More.

**Kilpatrick Bay.**—Bogha More is distant 800 yards from each of the two points forming Kilpatrick Bay, but the western passage into the bay, in which there are depths of from 7 to 10 fathoms (12.8 to 18.3 m.), is narrowed to about 200 yards by a cluster of rocks extending from the western point of the bay, of which Sgeir More, the outer rocks, is always above water and is steep-to.

There is a clear space  $\frac{1}{4}$  mile in extent with 9 fathoms (16.5 m.) water in Kilpatrick Bay, which is suitable for anchorage except with north to northwest winds, when a heavy swell sets in. The eastern passage into the bay is 600 yards wide between Ardchreshnish and the eastern of the two rocks with 6 feet (1.8 m.) water, but

the coast of Ardchreshnish, on the southeastern side, can be approached to the distance of 200 yards.

**Aird fhad nam Beach** ( $56^{\circ} 21' N.$ ,  $6^{\circ} 08' W.$ ), the extremity of a narrow promontory 40 feet (12.2 m.) high, is  $1\frac{1}{2}$  miles eastward of Ardchreshnish, the shore between receding to the southward nearly  $\frac{1}{2}$  mile, and forming Ormsaig Bay, with 6 and 7 fathoms (11 and 12.8 m.) 200 yards offshore. Between Ardchreshnish and this bay there are two rocks nearly 250 yards from the shore.

**Carraigeán**, a rock nearly 200 yards in extent, and awash at low water, lies 1,300 yards eastward from Aird fhad nam Beach, and 600 yards from the nearest shore with a passage between.

**Aird Ghuileagain Rock**, 200 yards off the eastern point of Torranbeg Bay, is of small extent, and dries 6 feet (1.8 m.) at low water; 300 yards eastward from the rock is a patch with 8 feet (2.4 m.) water. There is no safe passage inside these rocks. Ardchreshnish House open northward of Aird fhad nam Beach, bearing  $249^{\circ}$ , leads northward of Carraigeán, Aird Ghuileagain, and the 8-foot (2.4 m.) rocks.

**Sgeir Alltach**, a small rock which dries 9 feet (2.7 m.), is the outer end of a ledge extending 800 yards from the southern shore opposite Kilfinichen Bay on the northern side. Dun Ii, Iona, in range with the high-water line of Dun Bhuirg,  $263^{\circ}$ , leads northward of the rock.

**Anchorage.**—Inside and eastward of these reefs is a good though small anchorage in 4 fathoms (7.3 m.), completely protected from the westward, in which direction only it is open, by the ledge.

The entrance to this anchorage is 300 yards wide between Sgeir Chailleach and Sgeir na Rad, which dry 2 and 6 feet (0.6 and 1.8 m.), respectively. The belfry of Kilfinichen Church just in sight over the cliff of Aird Kilfinichen,  $353^{\circ}$ , astern, leads in, but as a slight divergence from the course would endanger a vessel, this anchorage should only be entered by strangers at or near low water, when these two rocks show.

**The southern shore** and eastern end of the loch may be approached to 300 yards from the salient points, but a patch of 2 fathoms (3.7 m.) lies 350 yards offshore  $\frac{1}{2}$  mile eastward of Sgeir Alltach, and a patch of  $3\frac{1}{2}$  fathoms (6.4 m.), mud, lies 400 yards offshore  $1\frac{1}{2}$  miles eastward of Sgeir Alltach.

**The northern shore.**—**Garradh na Srome**, the northern point of entrance to Loch Scridain, is bluff and steep-to, and the land within it rises in terraces to Bearreadh, a summit, 1,416 feet (431.6 m.) high, 1,400 yards northeastward. The north shore from Garradh na Srome to the head of the loch is steep-to at the distance of 200 yards.

**Kilfinichen Bay** ( $56^{\circ} 23' N.$ ,  $6^{\circ} 04' W.$ ), 4 miles within the entrance, is about  $\frac{1}{2}$  mile wide and recedes about the same distance, but shoals of sand and bowlders dry out  $\frac{1}{4}$  mile from the head of the bay. Anchorage may be obtained outside the shoals; in entering avoid a rocky spur extending 150 yards from the western point; the high-water mark of Aird Kilfinichen, the eastern point of the bay, in range with the high-water line of Aird Ceann Loch, at the head of Loch Scridain,  $63^{\circ}$ , leads southward of it.

The bay is at the foot of a glen dividing two ranges of high hills, and a church with a belfry stands close to the shore at the head of the bay.

**Sgeir Nighinn Mhic Chattain**, a small rock just above water, lies a little over 200 yards from the shore about 700 yards eastward of Aird Kilfinichen.

**Loch Beg**, a shallow basin at the head of Loch Scridain, has an entrance about 350 yards wide between the high-water lines. The water shoals from 5 fathoms (9.1 m.) outside the entrance to 2 fathoms (3.7 m.) in the narrows, and thence to a few feet in the basin within.

**Tidal currents.**—The current runs into Loch Scridain from low to high water, and out from high until low water; the greatest rate of these currents is about 1 knot at springs. With freshets from the currents into the loch, the outgoing current may be accelerated and the ingoing retarded.

**The coast** of Ard Meadhonach from Garradh na Srome, the northern point of entrance to Loch Scridain, trends northward for 1 mile, and then gradually turns northeastward toward Loch na Keal, distant 5 miles. Rudha na Uamh, 1 mile northward of Garradh na Srome, should not be closed within 400 yards, and farther northeastward rocks extend that distance offshore.

**Erisgeir**,  $330^{\circ}$  from Rudha na Uamh and about 2 miles offshore is 74 feet (22.6 m.) high, 200 yards in extent, and has deep water about 100 yards around. A rock, awash at high-water springs, lies nearly 200 yards southwestward of the islet, and a rocky patch of 5 fathoms (9.1 m.) lies 700 yards westward from it.

**Sgeir a Chlaidheimh More** (Great Sword Rock), a patch of rocks awash at low-water springs, 300 yards in extent, lies 2 miles  $85^{\circ}$  from Erisgeir and 1,600 yards from the coast of Mull. A 3-foot (0.9 m.) patch lies 1,100 yards  $220^{\circ}$  from the above sgeir, and the same distance offshore; while Sgeir a Chlaidheimh Beg (Little Sword Rock), which lies 700 yards eastward from Sgeir a Chlaidheimh More, is small and dries 7 feet (2.1 m.).

The extremity of Airde na Cailleach, in range with the north-western extremity of Inch Kenneth,  $27^{\circ}$ , leads northwestward of these rocks.

**Inch Kenneth** ( $56^{\circ} 27' N.$ ,  $6^{\circ} 09' W.$ ), 1,800 yards long northeast and southwest, with a greatest breadth of 600 yards, and 156 feet (47.5 m.) high, lies on the southern side of the entrance to Loch na Keal, and is separated from Rudha Baile na h Airde, the nearest point of Mull, by a channel  $\frac{1}{2}$  mile wide, which is encumbered by rocks. There is deep water at the distance of 200 yards from the western coast of the island, but from the northern and northeastern sides a rocky ledge extends northward nearly 800 yards to Maol na Domhnaich, which just covers at high-water springs, and from which foul ground extends nearly 200 yards to the northward and eastward.

Samalan Island, about  $\frac{1}{2}$  mile east-northeastward of Inch Kenneth, is small and 11 feet (3.4 m.) high. It is connected with Rudha Ghearrain by shoal water; and shoal water, on which is Sgeir Bhuidhe, a rock drying 3 feet (0.9 m.) extends 400 yards northwestward from the island.

**Giasgill Isles** are a group of islets 700 yards off the southern coast of Ulva Island and on the northern side of the entrance to Loch na Keal, and the group extends 750 yards northwest and southeast; the largest island is about 40 feet (12.2 m.) high and nearly 300 yards long.

**Loch na Keal** extends 5 miles eastward, with an average breadth of  $1\frac{1}{2}$  miles. Ben More, 3,163 feet (964.1 m.) high, and the loftiest mountain in Mull, lies about 2 miles southeastward from the southern part of the loch. Rudha Ghearrain, the southern entrance point of the loch, is a steep bluff, rising immediately within the coast to high land.

The fairway into the loch is between the Giasgill Isles and Maol an Domhnaich, and the navigable channel is about 700 yards wide with from 47 to 20 fathoms (86 to 36.6 m.) water in mid-channel and from about 12 to 8 fathoms (21.9 to 14.6 m.) on either side.

The outer part of Loch na Keal has a depth of from about 27 to 64 fathoms (49.4 to 117 m.) until close to Eorsa. Northward of that island the water at once shoals to from 10 to 23 fathoms (18.3 to 42.1 m.), and from thence toward the head of the loch to 14 and 5 fathoms (25.6 and 9.1 m.), the latter depth being 1,200 yards from the high-water line at the head. Southward of Eorsa there is a depth of from 35 to 20 fathoms (64 to 36.6 m.) until past the middle of the island, when it shoals to 15 and 12 fathoms (27.4 to 21.9 m.), mud, and affords excellent anchorage.

**Macquarie Rock**, which dries 1 foot (0.3 m.), lies 1,000 yards  $178^{\circ}$  from Airde na Cailleach, the southeastern point of Ulva. The southern extremity of Eilean Dubh in range with the northern extremity of Giasgill Isles,  $266^{\circ}$ , leads southward, and Anchor Point in range with Airde na Cailleach,  $347^{\circ}$ , leads eastward of the rock.

A bank with depths of from 4 to 9 fathoms (7.3 to 16.5 m.) extends northwestward from the rock to the coast of Ulva, and on the bank, 600 yards from Macquarie Rock, is a rock with 2 fathoms (3.7 m.) water.

**Leading mark.**—The left fall of Eorsa in range with the square summit southward of Cruach Mountain, 74°, leads in the fairway between Giasgill Isles and Maol an Domhnaich and southward of Macquarie Rock.

**Eorsa Island**, 1,600 yards long east and west, 1,000 yards broad, and 318 feet (96.9 m.) high, occupies a central position in Loch na Keal; it has deep water at the distance of 200 yards around, except Ullin Rocks, the outer of which, with 4 fathoms (7.3 m.) water, lies 500 yards northwestward of Ceann Eorsa, the western point of Eorsa, and between the outer rock and the point are several rocks with 5 fathoms (9.1 m.) water; and Sgeir Bhuidhe, which dries 9 feet (2.7 m.), situated on a bank with from 1 to 2½ fathoms (1.8 to 4.6 m.), extending 400 yards from the eastern end of the island. The channel northward of the island is 900 yards wide, and that southward of it 1,300 yards.

An Gearna (Ben More North) (56° 24' N., 6° 02' W.), 1,842 feet (571.4 m.) high, open westward of Eorsa Island, leads 200 yards westward of Ullin Rocks, and Cruach Mountain, in range with the northern extremity of Eorsa Island, leads close northward of them.

**Rock.**—A rock with less than 6 feet (1.8 m.) water lies 400 yards westward of Rudha na Moine, which is situated on the southern shore 1.1 miles eastward of Eorsa.

**Gallie Rocks**, with 4 feet (1.2 m.) of water and foul ground around, lie about 1,200 yards northward of Scarisdale Point (56° 28' N., 6° 02' W.), which is situated nearly ½ mile eastward of Rudha na Moine. At 500 yards northeastward of Gallie Rocks is a shoal of 3 fathoms (5.5 m.).

A small sharp summit on the sky line in range with a patch of wood and a conspicuous tree on the northern shore, 27°, leads northwestward of Gallie Rocks.

**Scarisdale Rocks** are a cluster of rocks which cover, extending 800 yards east and west, with a width of 350 yards, the western end being situated ½ mile 14° from Scarisdale Point.

There is shoal water between Gallie Rocks, the 3-fathom (5.5 m.) shoal, and Scarisdale Rocks, and the southern shore.

The summit of the largest Giasgill Islet in range with the northern point of Eorsa, 253°, leads northward of Gallie Rocks, the 3-fathom (5.5 m.) shoal, and Scarisdale Rocks.

**Rock.**—A rock with 4 fathoms (7.3 m.) water is situated 1,400 yards, 6° from the eastern Scarisdale Rock.

**Anchorage.**—Small vessels anchor 300 yards off the eastern side of Eorsa in 5 or 6 fathoms (9.1 to 11 m.), with Airde Dearg in range with the northern extremity of the island, but the whole of the space eastward of Eorsa, a distance of about  $2\frac{1}{2}$  miles, with a width varying from  $1\frac{1}{2}$  to  $\frac{1}{2}$  mile, affords good anchorage, avoiding the Gallie Rocks and the rocks to the eastward. This loch is, however, remarkable for the heavy squalls which sweep over it, and with strong westerly winds the swell reaches home.

There is a post-office at Gruline at the head of the loch.

**Directions.**—In approaching Loch na Keal from the southward, pass westward of the lighthouse on Dubh Artach, and do not bring it to bear westward of  $173^\circ$  until the peak of Lunga, the largest of the Treshnish Islands, is well open westward of Back More (Dutchmans Cap),  $53^\circ$ ; then keep that mark on until Dun Ii, Iona, is well open northward of Reidh Eilean,  $106^\circ$ , when steer to pass about  $\frac{1}{2}$  mile southward of Staffa. These directions take a vessel outside and westward of all the foul ground lying westward and northwestward of Iona.

From southward of Staffa bring the square summit southward of Cruach Mountain in range with the left fall of Eorsa,  $74^\circ$ , and enter the loch with this mark on.

When Anchor Point is in range with Airde na Cailleach bearing  $347^\circ$  to proceed through the north channel steer northeastward and bring Cruach Mountain open northward of the northern end of Eorsa; then steer to pass at least 200 yards northward of that island and eastward to the anchorage, observing the clearing marks for Gallie and Scarisdale Rocks.

By the south channel, when Anchor Point is in range with Airde na Cailleach, steer to pass midway between Eorsa and the southern shore of the loch, and anchor southward of the eastern end of Eorsa, or proceed northeastward and anchor off the northern shore, giving a berth of 600 to 800 yards to the eastern end of Eorsa, and observing the clearing marks for Gallie and Scarisdale Rocks.

The best way, however, is considered to be to enter by the south channel. Round Sgeir Bhuidhe at the eastern end of Eorsa Island, and keep to the northeastward until the summit of largest Giasgill Island is in range with the north point of Eorsa Island, bearing  $253^\circ$ , which range astern leads up to the anchorage at the head of the loch. Care should be taken when rounding Eorsa Island to observe the clearing marks for Gallie and Scarisdale Rocks.

**Tidal currents.**—The currents in the loch are weak; the east-going current begins at low water, and the west-going current at high water.

**The Sound of Ulva** ( $56^\circ 29' N.$ ,  $6^\circ 11' W.$ ), separates Ulva from Mull, and connects Loch na Keal with Loch Tuadh. It is



entered between Airde na Cailleach and Airde Dearg on the northern side of Loch na Keal, and has a width of about  $\frac{1}{4}$  mile for a distance of 800 yards, when it becomes narrow and shallow.

Eilean Casach is a small island on the eastern side of the entrance, connected with Mull at low water; rocky and foul ground extends 400 yards southward of it.

Clarke Rock, with  $3\frac{1}{2}$  fathoms (6.4 m.) of water, is a small patch situated in the middle of the entrance to the sound.

Anvil Point, in range with Anchor Point,  $318^\circ$ , leads westward of the rock.

**Anchorage.**—There is good anchorage for small vessels in the southern part of the sound in 7 fathoms (12.8 m.) of water and 300 yards from the Knoll. In entering pass 200 yards eastward of Airde na Cailleach.

**Tides.**—It is high water, full and change, in the Sound of Ulva at 5h. 23m.; springs rise 13 feet, neaps  $8\frac{1}{2}$  feet; neaps range 4 feet.

**Ulva and Gometra Islands** are together  $5\frac{3}{4}$  miles north-west and southeast (Ulva being 4 miles long and Gometra  $1\frac{3}{4}$  miles) and about 2 miles wide.

The islands are separated at high water by a narrow, intricate passage, known as the Brue, through which boats can pass 2 hours before high-water springs.

Ben Craigach, in a central position in Ulva, rises to the height of 1,019 feet (310.6 m.); rocks and deep inlets fringe the southern coasts of these islands, but none of the inlets, except Bailachloidh Harbor, afford any anchorage.

**Colonsay**, 1,300 yards long north and south, 1,000 yards wide, and 195 feet (59.4 m.) high, is 800 yards westward of Eilean Dubh, the outer islet of a cluster connected to the southern coast of Ulva. Eilean Dubh is steep-to, and the passage between it and Colonsay is good, but there is a small rock 2 feet (0.6 m.) high, and also patches of 2,  $1\frac{3}{4}$ , and  $3\frac{1}{4}$  fathoms (3.7, 3.2, and 5.9 m.) within about 400 yards from Colonsay, but detached from it.

**Bogha Ludden**, a patch of rocks with 4 feet (1.2 m.) of water, nearly 200 yards in extent, lies 1,300 yards  $5^\circ$  from the north point of Colonsay.

**Sgeir na Skeineadh**, a small rock which dries 9 feet (2.7 m.), lies 400 yards,  $320^\circ$  from Bogha Ludden and 600 yards from Rudha Bristeramh, the nearest point of Ulva; there is deep water between and around both these rocks. The southern extremities of Eilean Dubh and Inch Kenneth in range,  $117^\circ$ , leads southwestward of them.

**Bailachloidh Harbor**, a small basin at the southwestern end of the channel between Ulva and Gometra, affords excellent anchorage

for small vessels in 5 fathoms (9.1 m.); but sailing vessels require a leading wind to get in or out, as the entrance is too narrow to work through.

**Tides.**—It is high water, full and change, at Gometra at 5h. 29m.; springs rise  $11\frac{3}{4}$  feet, neaps 8 feet; neaps range  $4\frac{1}{2}$  feet.

**Moisgeir**, an islet 300 yards in extent and 21 feet (6.4 m.) high, lies 800 yards southward of the western point of Gometra; the passage between—except a very narrow channel with 6 feet (1.8 m.) water—being encumbered with rocks. A reef extends off the eastern coast of the islet from 400 yards northeastward to the same distance southward, and there is a small high-water rock near its southern end.

**Staffa** ( $56^{\circ} 26' N.$ ,  $6^{\circ} 20' W.$ ),  $2\frac{1}{2}$  miles westward of Colonsay, is  $\frac{1}{2}$  mile long north and south, with a greatest breadth of  $\frac{1}{4}$  mile, and its appearance is that of an uneven table-land. The coasts of the island, being of columnar formation, are precipitous, the greatest height, 129 feet (39.3 m.), being immediately over Fingals Cave, at the southern end. Low water and sunken rocks surround the island, a rocky cluster extending nearly  $\frac{1}{2}$  mile westward of it. The eastern coast should not be approached within 600 yards.

**Fingals Cave.**—The coasts of the island are indented by numerous caves, the most remarkable being Fingals Cave, the entrance to which is an archway 70 feet (21.3 m.) high, supporting a massive entablature 30 feet (9.1 m.) high; the cave recedes for about 230 feet. The front and sides are composed of complicated ranges of gigantic columns, of symmetrical though somewhat varied forms.

**Treshnish Isles** are a group of 6 principal islands, with numerous islets and rocks above and below water, extending  $5\frac{1}{2}$  miles northeast and southwest. The islands being covered with grass, are much used for pasturing cattle. The northeastern island, Cairn a Burgh Beg, is  $1\frac{3}{4}$  miles west-southwestward of Rudha Choill in Mull, the northern entrance to Loch Tuadh, a deep and clear channel, lying between.

**Back Beg and Back More** (or Dutchmans Cap) at the southwestern end of the group, are connected by broken rocky ground and together are over 1 mile long northeast and southwest, very narrow, and easily distinguished by a steep and remarkable hill rising suddenly from the comparatively low ground of the islands to a height of 278 feet (84.7 m.) at 700 yards from the northeastern end. A rocky ledge extends 250 yards northeastward of Back More, terminating in a rock with 3 feet (0.9 m.) water; with this exception there are no rocks over 200 yards from the shore.

**Lunga**,  $1\frac{1}{2}$  miles northeastward of Back More, with a deep channel between, is 1 mile long northeast and southwest, a greatest

width of  $\frac{1}{4}$  mile, and rises in terraces to a height of 328 feet (100 m.). A rock with 6 feet (1.8 m.) of water lies 400 yards off the southwestern point.

An extensive cluster of rocks and islets spreads out between Lunga and Fladda Island, nearly 1 mile to the northeastward, which island is separated from Cairn a Burgh More by a channel 700 yards wide, called Chaalais Leac a Bhainne.

The southwestern extremity of Lunga Island in range with the northwestern extremity of Back More, bearing  $235^\circ$ , leads south-eastward of the shoals between Lunga and Fladda Islands, but close to a  $1\frac{1}{2}$  fathom (2.7 m.) patch southeastward of Sgeir Fhiaclach.

**Cairn a Burgh Beg and Cairn a Burgh More** are the northeastern isles of the group; they are mere precipitous rocks, 110 feet (33.5 m.) high, inaccessible on all sides except by a narrow pass. On the summit ( $56^\circ 31' N.$ ,  $6^\circ 23' W.$ ) of the western and larger island are the ruins of a chapel and fort, and on the smaller those of a fort only. About 400 yards northwestward of Cairn a Burgh More is the Sgeir Mhic Fhionnlaidh, which dries at low water.

**Tidal currents.**—Eastward of the Treshnish Isles, and between that group and Gometra the current sets northeastward during the rising and southwestward during the falling tide. The currents have a general rate of less than  $\frac{3}{4}$  knot at springs, but the northeast-going current turns northward at an increased rate of  $2\frac{1}{2}$  knots between Cairn a Burgh Beg and Rudha Choill. The south-going current between Cairn a Burgh Beg and Rudha Choill has a rate of 2 knots until it emerges into the wider space between the Treshnish Isles and Gometra.

**Caution.**—In the vicinity and eastward of the Treshnish Isles, Ardnamurchan Light is shut in by the high land of Mull when bearing northward of  $24^\circ$ .

**Loch Tuadh** extends southeastward  $5\frac{1}{2}$  miles between Ulva and Gometra Islands on the south and the coast of Mull on the north; its width is 2 miles at the entrance, whence it gradually decreases to about 1 mile near the head.

When entering the loch do not approach the western coast of Gometra Island within  $\frac{1}{4}$  mile.

**Soriby Bay**, on the southern side and near the head of Loch Tuadh, affords the only safe anchorage in the loch during all winds, and is easy of access, with a moderate depth of water and good holding ground. A good mark for anchoring is Rudha Ghoile, the northwestern point of the bay, in range with the northern point of Ulva, about 1,600 yards beyond it, in about 9 fathoms (16.5 m.).

A patch, with  $4\frac{3}{4}$  fathoms (8.7 m.) water, lies 1,200 yards  $106^\circ$ , and a patch of 4 fathoms (7.3 m.) 900 yards  $70^\circ$  from Rudha Ghoile.

The entrance to the Sound of Ulva, between the eastern end of Ulva and the coast of Mull, is just eastward of Soriby Bay; the sound is a narrow intricate channel studded with rocks, only 50 yards wide at low water, with depths of from 3 to 9 feet (0.9 to 2.7 m.), and therefore only available for boats. A mail ferry crosses the sound.

**Sgeir Dhubhail** ( $56^{\circ} 30' N.$ ,  $6^{\circ} 11' W.$ ), a small rock which dries 7 feet (2.1 m.) lies in about mid-channel between Soriby Bay and Torr na Damh on the northeastern side of the loch, and immediately fronting the entrance to the Sound of Ulva. The north extremity of Cairn a Burgh Beg in range with the north extremity of Ulva leads southward; and Rudha Ghoile in range with the summit of Ben Eolas Airih,  $245^{\circ}$ , leads northward of the rock.

**Balligown Bay**, on the northeastern side of Loch Tuadh, is 600 yards, with depths of from 2 to 3 fathoms (3.7 to 5.5 m.) between its boundary points, but shoaling to 9 and 6 feet (2.7 and 1.8 m.) within. Bogha nan Ceard, a small rock which dries 2 feet (0.6 m.), lies off the bay 300 yards from the northwestern and 400 yards from the southeastern point of entrance, and 400 yards westward of it is a  $2\frac{1}{2}$ -fathom (4.6 m.) patch.

The shore of the loch northwestward from Balligown Bay ( $56^{\circ} 30' N.$ ,  $6^{\circ} 11' W.$ ) is comparatively clear as far as Traigh na Cille Bay, but Sgeir Leathann, awash at springs, lies nearly 300 yards offshore midway between the bays. A small detached sunken rock lies 400 yards off the western end of Traigh na Cille Bay; the north extremity of Cairn a Burgh Beg open of Burgh Bay Point,  $268^{\circ}$ , leads southward of it.

**Bogha More**, a small 12-foot (3.7 m.) patch, lies 550 yards  $184^{\circ}$  from Rudha n Tiompain; there is deep water close around the rock and between it and the shore; the upper cliffs of the Cairn a Burgh just open,  $272^{\circ}$ , leads southward of it.

A low-water rock lies nearly 400 yards offshore between the points of the bay northwestward of Rudha n Tiompain. Torr na Damh Point and Rudha n Tiompain in range,  $106^{\circ}$ , leads southwestward of it.

**Tidal currents.**—The tidal current runs into Loch Tuadh during the rising tide and out during the falling tide; the currents are weak.

**Calgary Bay.**—The coast from Rudha Choill trends from northwest to north  $1\frac{1}{2}$  miles to Treshnish Point and then trends northeastward to the head of Calgary Bay. This bay being open to southwesterly and westerly winds is not suitable for anchorage except with northerly winds and during fine weather; foul ground and a ledge of rocks extends  $\frac{1}{4}$  mile off Arein Point, its northern

entrance point. At the head of the bay is Calgary Castle, and there is a postal telegraph office at Calgary.

The coast of Mull from Arein Point trends northward  $1\frac{3}{4}$  miles to Caliach Point, and rocks extend to a distance of  $\frac{1}{4}$  mile off it. From Caliach Point it turns abruptly eastward for upward of 2 miles to Airds Point, just westward of which is Langamul Bay, a bight open to the northward.

Loch Cuan entrance lies between Airds Point and Quinish Point, nearly  $1\frac{3}{4}$  miles to the northeastward. The loch extends about 2 miles to the southward and affords good shelter except from northerly and northwesterly winds, which send in a heavy swell. The whole of the western side of the loch is rocky and foul.

Sgeir More, which dries 7 feet (2.1 m.), lies nearly midway between but a little outside the line of the two entrance points; foul ground extends  $\frac{1}{4}$  mile southward of this rock, terminating in a patch with 3 feet (0.9 m.) water.

Ben Hiant open northward of Sorne Point,  $62^\circ$ , leads northward, and Kilchrist Farm in range with Airds Point,  $209^\circ$ , leads northward of the shoal. Croag Inn, a conspicuous white house, in range with or a little eastward of Cairn More, a mountain with a conical peak, 1,126 feet (343.2 m.) high,  $180^\circ$ , leads through the eastern entrance.

Sgeir Beg.—A rocky ledge extends 800 yards off the western shore of the loch, eastward of Airds Point; Sgeir Beg, the outer rock of the ledge, dries 7 feet (2.1 m.), and either Rudh Dubh, or the southern high fall of Caliach Point, open northward of Airds Point,  $248^\circ$ , leads northward of it.

Anchorage.—Anchorage in 5 or 6 fathoms (9.1 or 11 m.) with Croag Inn and Cairn More in range. Small vessels can run farther in and anchor in 2 fathoms (3.7 m.) nearly abreast of the inn.

Tides.—It is high water, full and change, in Loch Cuan, at 5h. 36m.; springs rise 13 feet, neaps  $9\frac{1}{2}$  feet. The currents in the loch are weak, but run in with the rising and out with the falling tide.

Caution.—Ardnamurchan Light is not visible when bearing less than  $24^\circ$  from Caliach Point; and Rudhanan Gall Light, Sound of Mull, is shut in by Ardmore Point when bearing eastward of  $117^\circ$ .

Cuan More Rocks extend  $\frac{1}{4}$  mile off the entrance to Loch Mingary, a small narrow bight 700 yards eastward of Quinish Point; the outer rock is above water. Sorne Point is 1,800 yards farther eastward, and thence the coast is bold to Achin na Carraig ( $56^\circ 39'$  N.,  $6^\circ 09'$  W.), a distance of 1.6 miles.

About 300 yards southeastward of Sorne Point is a landing place where vessels discharge coal in fine weather.

**Ardmore Bay.**—Ardmore Point, the northern extremity of the Island of Mull, 1,200 yards eastward of Achin na Carraig, is low, rocky, and steep-to. Between it and Stron Beg, the southern extremity of the land of Ardnamurchan, a distance of rather more than  $1\frac{1}{2}$  miles, is the northern entrance to the Sound of Mull. Ardmore Bay, immediately westward of the point, affords shelter from southerly winds, and is useful as a temporary anchorage for sailing vessels when the southerly wind in the sound is too strong to work against.

The 5-fathom (9.1 m.) curve is 300 yards from the head of the bay.

**Tidal currents.**—Between the Treshnish Isles and Caliach Point the current runs to the northeastward from 5 hours before until 1 hour after high water and to the southwestward from 1 hour after high water until 5 hours before the next high water. The greatest rate of these currents is  $2\frac{1}{2}$  knots close to the salient points, but only 1 knot across the entrance to Calgary Bay and  $1\frac{1}{2}$  knots offshore. In Calgary Bay the currents are weak. From Caliach Point to Ardnamurchan Point the current sets northeastward from  $5\frac{1}{2}$  hours before until  $\frac{1}{2}$  hour after high water and southwestward from  $\frac{1}{2}$  hour after high water until  $5\frac{1}{2}$  hours before the next high water; the greatest rate of these currents is  $1\frac{1}{4}$  knots at springs.

**Stanton Banks** lie between  $56^{\circ} 04'$  and  $56^{\circ} 19'$  N. and  $7^{\circ} 43'$  and  $8^{\circ} 02'$  W., within the 50-fathom (91.4 m.) curve. The least water yet found on these banks is 16 fathoms (29.3 m.), and they form an admirable fishing ground for almost every description of deep-sea fish. The area for about 35 miles to the westward of these banks has not been examined.

**Tiree and Coll Islands** lie northwestward of the Island of Mull and are separated from it by the Passage of Tiree, a channel  $5\frac{1}{2}$  miles wide at its narrowest part; there are numerous rocks and islets adjacent to the islands.

Tiree and Coll, which are separated from each other by Gunna Sound, an intricate channel about 1,400 yards in width, are together 22 miles in length northeast and southwest, and shelter the west coast of Mull during northwesterly or northerly gales, but the 20-fathom (36.6 m.) plateau on which they stand includes the Skerryvore and other rocks, and extends over a distance of 36 miles. The islands form a part of Argyllshire.

It is advisable for strangers to give a wide berth to both islands.

**Communications.**—The islands are in telegraphic communication with each other, a cable crossing Gunna Sound, and with the mainland through the Island of Mull.

A mail steamer from Oban calls 3 times a week at each of the islands.

**Skerryvore** ( $56^{\circ} 19' \text{ N.}$ ,  $7^{\circ} 07' \text{ W.}$ ), one of a cluster of rocks extending over a distance of 4 miles northeast and southwest, is about 9 miles  $210^{\circ}$  from Ru Kirkipol, the southwestern extremity of Tiree. Several of the Skerryvore Rocks are above water, but the numerous sunken rocks render a near approach very hazardous. A rock with a depth of  $2\frac{3}{4}$  fathoms (5 m.) lies about 1,600 yards southwestward, and one of 5 fathoms (9.1 m.) at 1,200 yards southward of the lighthouse, both being within the 10-fathom (18.3 m.) curve. Stevensons Rock, under water, 2 miles  $245^{\circ}$ ; Freshnel Rock, with 4 fathoms (7.3 m.) of water,  $2\frac{1}{2}$  miles  $234^{\circ}$ ; and Mackenzies Rock, which dries 4 feet (1.2 m.)  $2\frac{3}{4}$  miles  $224^{\circ}$  from Skerryvore Lighthouse, are the outer rocks on the southwestern side.

NOTE.—Dubh Artach Lighthouse,  $19\frac{1}{2}$  miles  $126^{\circ}$  from Skerryvore, has a red band painted around the middle.

**Light.**—A flashing white light, 150 feet (45.7 m.) above water, visible 18 miles, is shown from a gray granite tower, 158 feet (48.1 m.) above water, on Skerryvore.

**Fog signal.**—An explosive signal is sounded. See Light List.

**Boinshly Rock**, almost awash at low water, lies  $3\frac{3}{4}$  miles  $44^{\circ}$  from Skerryvore Lighthouse and  $5\frac{1}{4}$  miles from Ru Kirkipol. There is deep water on both sides of Boinshly Rock, but mariners should not take either channel, as the locality is never free from a long heavy swell, which rises into a breaking sea even with moderate breezes, especially on the Outer Hurricane Rock, with 7 fathoms (12.8 m.) and other patches of greater depth lying westward of the island.

Boinshly Rock is almost invariably marked by heavy breakers, but in northwesterly gales the whole space between Skerryvore and Tiree is occupied by a continuous breaking sea, which makes it impossible to recognize the position of the rocks.

**Rocks.**—A rock with a depth of  $2\frac{3}{4}$  fathoms (5.0 m.) has been found about 1,600 yards southwestward of the lighthouse and one of 5 fathoms (9.1 m.) at 1,200 yards southward of the lighthouse, both within the 10-fathom (18.2 m.) curve.

**A patch** of  $1\frac{1}{2}$  fathoms (2.7 m.) (P. D.) is charted 1,000 yards eastward of Boinshly Rock.

**Caution.**—There is reason to believe that the heavy seas of this locality have caused the loss of many ships, and the mariner should avoid altogether so dangerous a place.

**Tides and tidal currents.**—It is high water, full and change, at Skerryvore at 5h. 25m., which is 5 minutes earlier than at Heynish Pier (Tiree), where the rise is 12 feet at springs and 6 feet at neaps.

The north-going current in the vicinity of Skerryvore runs during the rising and the south-southwest-going current runs during the falling tide. The rate of the currents over the shoal ground near the lighthouse is 4 to 5 knots at springs and 2 to 3 knots at neaps, but outside the 20-fathom (36.6 m.) curve not more than half that rate. These strong currents cause overfalls and whirls in their vicinity.

**Tiree Island** is 10 miles long, with a breadth varying from  $\frac{1}{2}$  mile to 5 miles; the principal hills are at its western end, the widest part of the island, Ben Heynish ( $56^{\circ} 27' N.$ ,  $6^{\circ} 55' W.$ ), 468 feet (142.6 m.) high, being near the southern end, and Ben Hough, 413 feet (125.9 m.) high, near the northwestern end.

The island is, however, generally low, and near the middle is a remarkable plain, called the Reef, about 1,560 acres in extent.

The population was 1,716 in 1921.

Fishing is carried on to some extent with long lines, but the exposed position of the islands and rugged nature of the coasts prevent the fishermen from obtaining anything beyond a moderate offing, except in fine settled weather.

Although running water is scarce there are several lakes; Lake Phuill, near the southern end of the island, being nearly  $\frac{3}{4}$  mile long.

**Anchorage.**—The northern and western coasts of the island are entirely devoid of shelter, except for the small fishing boats which venture out in fine weather. On the southern coast are several bays, in one of which, Gott Bay, moderately good anchorage may be obtained in summer, while in a small indentation on the eastern coast in Gunna Sound is a temporary anchorage, locally known as Caolas, suitable for small craft in fine weather.

**Hurricane Rocks.**—Outer Hurricane Rock,  $2\frac{1}{4}$  miles  $272^{\circ}$  from Ru Kirkipol, is a rocky patch of 7 fathoms (12.8 m.), and during stormy weather sea breaks heavily on it. Inner Hurricane Rock is a patch of  $3\frac{1}{4}$  fathoms (5.9 m.) lying about  $\frac{1}{2}$  mile  $268^{\circ}$  from Ru Kirkipol; a similar patch with the same depth of water lies 800 yards outside it in the same direction from the point.

**Dubh Sgeir**, 2 miles  $317^{\circ}$  from Rudha Craignish, is small, awash at high water, and the most off-lying of the shoals fringing the northwestern coast of Tiree. There is deep water around Dubh Sgeir, but the channel between it and Hough Skerries, a large reef extending from Tiree, is only  $\frac{1}{2}$  mile wide.

**Caution.**—No vessel should pass between these rocks and the shore under any circumstances, nor would any stranger be justified in approaching this coast sufficiently near to occasion the possibility of danger from even the most off-lying rocks.



**Bo Deobedal**, the western of these shoals, is three patches with from 3 to 14 feet (0.9 to 4.3 m.) water, the outer patch being 1,500 yards offshore; Ben Hough Summit, in range with the inner rocks high-water mark on the eastern side of Balephuill Bay, leads westward of this shoal.

**Ringdove Rock**.—There are numerous off-lying shoals on the southern promontory of Tiree, some extending  $\frac{3}{4}$  mile from the shore. Ringdove Rock, with 2 fathoms (3.7 m.) of water, the easternmost, is situated 1,400 yards  $133^\circ$  from Ru Barrachaol, the western point of Heynish Bay; the summit of Ben Hough in range with Mannel Store, a conspicuous white two-storied building near the shore, leads eastward of it.

**Lighthouse establishment**.—At the southern end of Tiree, and on the western side of Heynish Bay ( $56^\circ 28' \text{ N.}$ ,  $6^\circ 56' \text{ W.}$ ), is the establishment connected with Skerryvore Lighthouse, with a stone pier and dock for the use of the lighthouse tender. These works at high-water springs afford a depth of 11 feet (3.4 m.) at the pierhead and 10 feet (3.1 m.) over the dock sill; the latter, protected by booms, is 20 feet broad at entrance, the masonry over all being 100 feet by 50 feet, but the excavation is only sufficient for a vessel of 35 tons. This dock is often difficult and sometimes impossible of access, owing to the run of the swell upon the shore, which is especially heavy with southwest to northwest winds.

From a round stone tower at the establishment, day communication by signal is maintained with Skerryvore Lighthouse, and if at any time the return of the tender from the lighthouse is delayed beyond sunset, a light is shown from the tower until her arrival off the pier.

**Cleit Hianish**, a small conspicuous rocky islet, 39 feet (11.9 m.) high, lies about 1 mile southwestward of Scarnish, and off the eastern point of Heynish Bay; it is surrounded by rocks on all sides, but the most off-lying is Sgeir Fada, which dries 6 feet (1.8 m.), with deep water close outside it, and is situated about 600 yards  $94^\circ$  from the islet and  $\frac{1}{2}$  mile from Tiree.

**Scarnish**, which is the trading center of Tiree, is a small creek with a very narrow entrance; within, on the eastern side, is a quay, which dries at low water. Coasters of about 8 feet draft resort here and ground alongside the pier; but they are frequently detained by the heavy swell setting in through the opening.

**Light**.—A flashing white light, 44 feet (13.4 m.) above water, visible 11 miles, is shown from a small white tower on the south side of the entrance to Scarnish Harbor.

**Gott Bay**, on the southeastern side of Tiree, is 1 mile wide between its entrance points, whence it falls back 1 mile to the north-

ward. Both points of the bay are fringed with rocks, and others, some of which cover, exist within the bay, so that local knowledge is necessary for entering it.

The anchorage is in  $2\frac{3}{4}$  fathoms (5 m.), sand; it is suitable only for small vessels and is on the western side of the bay, abreast of the manse, a two-storied white house.

Water can be procured from a well below the manse, and supplies of a very limited description from Scarnish.

**Pier Light.**—There is a pier near the southeastern point of the bay from which two fixed white lights, 16 and 23 feet (4.9 and 7 m.) above water and visible 5 miles, are shown.

The bottom is foul, with shallow patches to a distance of 1,200 yards southeastward of the pier; the point should be given a wide berth.

**South Bank**, a small patch with 15 fathoms (27.4 m.) of water, and depths of 30 fathoms (54.9 m.) around, lies 3 miles  $165^\circ$  from the eastern point of Gott Bay. Scarnish Bank, with 13 fathoms (23.8 m.) water, lies  $1\frac{3}{4}$  miles  $150^\circ$  from the same point.

**Tides.**—It is high water, full and change, at Heynish Pier and at Scarnish at 5h. 30m.; springs rise 12 feet, neaps 9 feet.

**Coll Island**, separated from Tiree by Gunna Sound, is  $10\frac{3}{4}$  miles long northeast and southwest, with a greatest breadth of 3 miles, Ben Hagh ( $56^\circ 38' N.$ ,  $6^\circ 36' W.$ ), its highest hill, being 347 feet (105.8 m.) high. It presents an unusually bleak and sterile appearance from seaward.

A great portion of the island is barren moor, though about a third of its surface consists of arable, meadow, and pasture land. The remains of several Danish forts and religious houses exist, and stone coffins as well as coins and other relics of antiquity have been found. The black cattle reared in Coll are prized. The inhabitants are hardy and intelligent; they numbered 383 in 1921.

The northwestern side of the island is open and without shelter, and on the southeastern side shelter can only be obtained in Loch nan Eathar, where there is a very limited space for small vessels of 5 feet draft.

**Gunna Sound** is encumbered by rocks and should be avoided by strangers.

**Roan Bogha**, a small rock off the southeastern entrance to Gunna Sound, 1.9 miles  $219^\circ$  from Eilean Soa, the southern extremity of Coll, is just awash at low-water springs, and there is deep water close around.

**Buoy.**—A spherical buoy, painted red and white in horizontal stripes, and surmounted by a staff and cross, is moored in 13 fathoms (23.8 m.) on its southwestern side, but the position of the buoy is not

to be relied on. Should the buoy be adrift the rock is only marked by a blind breaker, and great caution is necessary in its vicinity.

Ruaig Cleit, a small button-shaped islet off the southeastern extremity of Tiree, in range with the northern foot of Ben Heynish, leads southward, and the same islet in range with the southern shoulder of Ben Heynish leads northward 300 yards from the rock; a bearing of Ben Heynish, however, suffices to clear it.

**Loch Breac achadh (Breacacha)**, on the southern side of the island about 3 miles eastward of Gunna Sound, is visited by an occasional vessel to receive the produce of the dairy farms in the vicinity of Breacacha Castle, a conspicuous white building at the head of the loch. Coll butter and cheese always command a ready sale. This loch should not be approached without local knowledge, as the shores east and west are studded with rocks.

**Loch nan Eathar** ( $56^{\circ} 37' N.$ ,  $6^{\circ} 31' W.$ ), on the southeastern side of Coll, 4 miles northeastward from Loch Breacacha and  $4\frac{1}{2}$  miles from the northeastern point of the island, extends about  $\frac{3}{4}$  mile northward, and is studded with numerous islets and rocks. At the head of the loch on its western side is a stone slip and pier, fronting a small cluster of houses with an inn and store, known as Arinagour, the trading center of the island.

There is a depth of 9 feet (2.7 m.) alongside the pier at high-water springs.

Loch nan Eathar is divided into two parts by Eilean nan Eathar, 54 feet (16.5 m.) high, the western and larger part being that most frequented for communicating with Arinagour, but as it is open to the southward, except for the partial shelter afforded by Chieftain and McQuarry Rocks, it is only suitable for temporary anchorage even in summer.

**Chieftain Rock**, at the outer end of a shoal 200 yards long, dries 6 feet (1.8 m.); it is the most off-lying shoal of Loch nan Eathar, and from it the inn is in range with the salient point close to the southern side of the houses of Arinagour.

**Light buoy.**—A red light buoy, exhibiting a flashing white light, is moored in 6 fathoms (11 m.) off the rock.

**McQuarry Rock**, at the southern end of a shoal 100 yards in extent, and  $\frac{1}{2}$  mile within Chieftain Rock, dries 8 feet (2.4 m.). The deep water passage between is nearly 200 yards wide, the leading mark through being the south extremities of the Maoil and Eilean Dubh in range.

**Directions.**—At the inner end of the narrow eastern opening of the loch is a sheltered space, about 200 yards in extent, where anchorage can be obtained by vessels of 5 feet draft; it is only accessible with a leading wind, and should not be attempted by a stranger.

The bold headland known as the Maoil, 143 feet (43.6 m.) high, on the eastern side of the entrance, is steep-to, and though the sea may be greatly agitated during southerly winds it may be approached with safety. When nearing the entrance between the Maoil and Eilean Dubh, which is not more than 200 yards across, only sufficient sail should be carried to keep the vessel under command.

When the high-water rock midway between Eileans Dubh and nan Eathar is in range with the southern extremity of Ornsay, approach the eastern shore until the western end of the inn, a white two-storied building, is in range with the western end of Glas Eilean. Steer in with this mark on, and after passing the rock, which dries 3 feet (0.9 m.), anchor about midway between it and Glas Eilean in 7 feet (2.1 m.) of water, with the inn in range with the eastern end of Glas Eilean. Vessels may also lay out hawsers to any of the 5 rings around the shores of the anchorage, according to the direction of the wind.

**Tides.**—It is high water, full and change, in Loch nan Eathar at 5h. 41m.; springs rise  $12\frac{1}{2}$  feet, neaps  $9\frac{1}{2}$  feet. It is slack water off the loch  $1\frac{1}{2}$  hours after high and low water.

**Cairns of Coll.**—The coast eastward of Loch nan Eathar is generally steep-to, but a cluster of rocky islets and rocks extends 1.6 miles off the northeastern end of Coll, without any practical passage between them except for boats or very small craft with local knowledge. The Cairns of Coll ( $56^{\circ} 43' N.$ ,  $6^{\circ} 26' W.$ ), the northeasternmost of these rocks, are 2 rocks which cover 1 foot (0.3 m.) at high-water springs, and consequently are nearly always visible or marked by breakers.

**Light.**—A flashing white light, 74 feet (22.6 m.) above water, visible 13 miles, is shown from a small white tower, 25 feet (7.6 m.) high, on the middle of Suil Ghorm, situated  $\frac{1}{2}$  mile southwestward of the Cairns of Coll.

The passage between the Cairns of Coll and Suil Ghorm is deep and clear, but requires local knowledge, as the rate of the tidal currents is considerable.

**Bogha More** is a small rock, drying 5 feet (1.5 m.), at the northern end of a shoal 300 yards in extent and  $\frac{1}{2}$  mile from the northeastern point of Coll Island. It is almost always marked by breakers. All these rocks should be given a wide berth.

**Tidal currents.**—In the Passage of Tìree the currents at the southern entrance sets northeastward from  $5\frac{1}{2}$  hours after high water until one-half hour before the next high water and southwestward from one-half hour before until  $5\frac{1}{2}$  hours after high water.

Between the Treshnish Isles and Tìree the current runs northeastward from low until high water and southwestward from high until low water.

At the northern entrance to the Passage of Tìree the current runs northeastward from  $5\frac{1}{4}$  hours before until three-fourths hour after high water and southwestward from three-fourths hour after high water until  $5\frac{1}{4}$  hours before the next high water.

Close inshore off Loch nan Eathar the northeast-going current begins  $4\frac{1}{2}$  hours before high water and the southwest-going  $1\frac{1}{2}$  hours after high water. The rate of these currents does not exceed  $1\frac{1}{2}$  knots at springs.

**Hawes Bank**, the southwestern end of which lies 11 miles westward of Suil Ghorm, extends thence northeastward  $7\frac{1}{2}$  miles, with a width varying from  $\frac{1}{2}$  to  $3\frac{1}{2}$  miles, and depths of from 11 to 20 fathoms (20.1 to 36.6 m.) generally rocky bottom. Though carefully examined, however, from the nature of the soundings there may be less water in places than has been discovered. The least known depth of 11 fathoms (20.1 m.) lies  $8\frac{3}{4}$  miles  $300^\circ$  from Suil Ghorm. The sea breaks heavily on this bank in stormy weather.

**Tidal currents.**—The current runs northward on Hawes Bank from  $5\frac{1}{2}$  hours before until one-half hour after high water and southwestward from one-half hour after high water until  $5\frac{1}{2}$  hours before the next high water.

**Ardnamurchan** ( $56^\circ 44' \text{ N.}$ ,  $6^\circ 13' \text{ W.}$ ) is a rugged mountainous promontory on the northern side of the entrance to the Sound of Mull.

**Light.**—A fixed white light, 180 feet (54.9 m.) above water, visible 18 miles, is shown from a gray granite tower, 118 feet (36 m.) high, on the northwestern extremity of the promontory about  $\frac{1}{2}$  mile northward of Ardnamurchan Point. The lighthouse is surrounded by a high white wall, over which the chimneys of the dwelling-houses within just show.

**Fog signal.**—An explosive signal is sounded. See Light List.

**The coast** from Ardnamurchan Lighthouse is steep-to, bold, rocky, and trends southward and southeastward  $4\frac{1}{2}$  miles to Stron Beg, a high, steep, rocky point.

About 2 miles southward from the lighthouse is Ploughmans Rock, a bare rocky islet separated from the shore by a passage 100 yards wide, and steep-to to seaward. Just northward of Ploughmans Rock is Port Kenneth, a little creek.

Within Stron Beg the land rises irregularly to a considerable height, culminating in Ben na Seilg, 1,117 feet (340.5 m.) high and  $\frac{3}{4}$  mile from the sea.

**Rock.**—A rock of small extent with 9 fathoms (16.5 m.) least water, lies about  $3\frac{1}{4}$  miles  $211^\circ$  from Ardnamurchan Lighthouse.

The patch, rising from deep water, has a breaking sea over it in heavy weather, when it should be avoided.

**Fishing bank.**—About midway between Kingstone Point,  $1\frac{1}{2}$  miles northwestward of Stron Beg and Sorne Point, in Mull, is a bank, nearly,  $\frac{1}{2}$  mile in extent, with from 10 to 20 fathoms (18.3 to 36.6 m.) of water, surrounded by depths of from 59 to 28 fathoms (107.9 to 51.2 m.). It is a good fishing ground, but in stormy weather it is advisable to avoid it, as the sea in its vicinity is heavy and irregular.

**Kilhoan Bay**, immediately eastward of Stron Beg, is rocky and shallow, and consequently not a good anchorage. The shores are fringed with rocky reefs, especially the eastern point of the bay, where they extend off 500 yards. Along the northern shore are the scattered cottages of the hamlet of Kilhoan.

Red Rock, near the western side of the bay and about 200 yards offshore, dries 6 feet (1.8 m.), leaving a 3-foot (0.9 m.) channel inside it. A rock with 3 fathoms (5.5 m.) of water lies 350 yards northeastward of Red Rock. Bogha na Keil, which uncovers at low water, lies in the middle of the bay, and is marked by a perch; inside there are depths of 3 to  $1\frac{1}{2}$  fathoms (5.5 to 2.7 m.) sand, where small vessels occasionally shelter.

**Mingary Bay** lies eastward of Kilhoan Bay between Mingary Point and Macleans Nose, a steep rocky point,  $2\frac{1}{4}$  miles to the eastward, whence the land rises in rugged picturesque steps to Ben Hiant ( $56^{\circ} 42' N.$ ,  $6^{\circ} 01' W.$ ), a double-topped mountain, 1,722 feet (524.8 m.) high, 1 mile to the northeastward. About 1 mile south-eastward of Kilhoan, and inside a small rocky promontory jutting into the head of the bay, are the ruins of Mingary Castle, an irregular and extensive pile of buildings, whose front forms the continuation of a vertical rock.

A small pier extends from the eastern side of Mingary Point, and on its northern side there is a depth of 4 feet (1.2 m.) Mail steamers between Oban and Bunessan call here.

A rock with 1 foot (0.3 m.) of water lies close to the head of the pier. Marv Rock, with  $1\frac{3}{4}$  fathoms (3.2 m.) of water, lies nearly 400 yards offshore 340 yards eastward of Mingary Point Pier, and a rock with  $2\frac{3}{4}$  fathoms (5 m.) of water lies inside it.

Mingary Rock, situated 1,100 yards eastward from Mingary Point, has 4 fathoms (7.3 m.) of water.

**Light.**—A fixed red light is shown from the end of the pier on Mingary Point when steamers are expected.

**Macparlin Rock**, a pinnacle with  $3\frac{3}{4}$  fathoms (6.9 m.) water, is situated 1,800 yards  $230^{\circ}$  from Maclean's Nose, and on the north-western edge of a bank with depths of 11 to 18 fathoms (20.1 to 32.9 m.) which extends 1,800 yards northeast and southwest, partly

across the entrance to Loch Sunart, with a width of about 300 yards.

**The Sound of Mull** forms the great highway for steamers and sailing vessels of moderate size, bound between the southern ports on the west coast of Scotland and the Pentland Firth. It possesses many good temporary anchorages along its shores, while near its northern end is the harbor of Tobermory, which is easy of access by night or day either as a place of refuge or as a port for obtaining supplies.

The distance through the sound from midway ( $56^{\circ} 40' \text{ N.}$ ,  $6^{\circ} 08' \text{ W.}$ ) between Ardmore Point and Stron Beg, at the northern entrance, to a similar position between Scallastle Point and Rudha an Ridire, at the southern entrance, is about 19 miles, and the general direction about  $127^{\circ}$ . Many shoals exist in the sound, but they are mostly marked by buoys.

As a rule sailing vessels navigating the sound should keep near the weather shore, particularly in fine weather, with easterly to northeasterly winds, for frequently there is a fine fresh breeze on the weather side, while there is scarcely any wind to leeward. Under Ben Hiant and about Mingary Castle, at the northern entrance, a fresh gale sometimes blows continuously for hours, whilst at Tobermory and adjacent parts of the sound the wind is light.

**Pilots** can be obtained for the sound and for all parts of the Hebrides at Tobermory.

**The coast** of Mull from Ardmore Point, which is steep close-to, trends southeastward  $\frac{1}{2}$  mile; it then falls back to the southward and westward and rises to steep high braes, forming Bloody Bay. The shores of this bay are clean, with the exception of Sgeir Sgreabach, which dries 5 feet (1.5 m.) and lies 800 yards  $283^{\circ}$  from Rudha nan Gall Lighthouse and 100 yards from the shore. This bay is used as a quarantine anchorage for Tobermory when so required.

**Rudha nan Gall** is a flat rock, projecting 50 yards from the shore and steep-to on its outer side.

Auliston Point, on the eastern side of the sound, bears  $72^{\circ}$ , distance  $2\frac{1}{4}$  miles from Rudha nan Gall; this point is common to the Sound of Mull and also to the entrance to Loch Sunart.

**Light.**—A fixed light with white, red, and green sectors, 55 feet (16.8 m.) above water, visible 12 miles, is shown from a white tower, 63 feet (19.2 m.) high, on Rudha nan Gall.

**New Rocks** are a cluster of rocky patches, the shoalest of which has 3 feet (0.9 m.) of water and is situated 1,800 yards,  $24^{\circ}$ , from Rudha nan Gall.

**Buoy.**—A red conical buoy is moored in  $5\frac{1}{2}$  fathoms (10.1 m.) close southward of the southwestern of these rocks.

**Red Rocks** are three isolated rocks, nearly connected together at low water; the highest dries 7 feet (2.1 m.) and is situated  $1\frac{1}{8}$  miles 300° from Auliston Point.

**Stirk Rocks.**—Big Stirk is about 1 foot (0.3 m.) high and lies 1,400 yards, 259°, from Auliston Point; and Little Stirk, which dries 10 feet (3.1 m.) is 300 yards, 190°, from Big Stirk.

The channel between the Stirks and the shore southward of Auliston Point is about 600 yards wide with depths of from 16 to 46 fathoms (29.3 to 84.1 m.).

New Rocks, Red Rocks, and Stirk Rocks form roughly a triangle, within which are numerous rocks and shoals. No vessel should attempt to pass between these rocks, for which see the chart.

The kelp on the rocks with depths of less than 6 feet (1.8 m.) shows at low water.

**Clearing marks.**—Aros Waterfall on Speine Beg in range with Rudha na Leip, bearing 168°, leads westward, and the peak of Risga Island in range with the northern high-water line of Oronsay, 83°, leads northward of all the rocks in the vicinity of New and Red Rocks.

**Tobermory Harbor.**—A steep, bold shore, rising precipitously from the lighthouse to a height of 413 feet (125.9 m.), sweeps around southward into the harbor of Tobermory, which is  $\frac{3}{4}$  mile long northwest and southeast and  $\frac{1}{2}$  mile wide, with good holding ground. The principal entrance, northwestward of Calve Island, is 800 yards wide.

Tobermory (Mary's Well) (56° 37' N., 6° 04' W.), the principal town in the Island of Mull, had a population of 850 in 1921; it stands in a small bay in the northwestern angle of the harbor, and from the formation of the land, which is very steep, is built in a straggling manner.

The following are conspicuous: A hotel with a turret in the north-eastern part of the town, a church with a square tower, and a Free Church with a spire on the hillside in the middle, and a distillery with a tall chimney at the southwestern end.

A radio mast, 155 feet (47.2 m.) high, near the Free Church, is also conspicuous. It is used for communication with Loch Boisdale.

Aros House, a castellated building with a turret and flagstaff, is situated on the northwestern side of Loch an a'Ghurrabain, a fresh-water lake at the southern end of the harbor; and a little westward of it is the River na Meall, a considerable stream forming a large waterfall  $\frac{1}{2}$  mile inland, which is visible from seaward.

**Calve Island** (Eilean na Chailbhe), 59 feet (18 m.) high, is 1 mile in length northwest and southeast, and nearly bold at the northwestern end.



Acairseid More, a small bight in which is a rock that dries 1 foot (0.3 m.) at low water, divides Calve Island from Eilean na Beithe, 34 feet (10.4 m.) high, the southern end of which island is joined to Calve Island.

Eilean Dheanish, a small islet 7 feet (2.1 m.) high, is 50 yards off the northwestern end of Eilean na Beithe, to which it is joined at low water.

Bodach a'Chailbhe (Old Man of Calve), an isolated pillar 28 feet (8.5 m.) high, is connected with the northeastern coast of Calve Island, and is conspicuous when open of the island.

Two rocks which uncover 5 feet and 3 feet (1.5 and 0.9 m.), respectively, at low water lie a short distance off the eastern side of Calve Island.

**Depths.**—There are depths of from 30 to 39 fathoms (54.9 to 71.3 m.) in the northern entrance to Tobermory Harbor, both shores being steep-to at a distance of 100 yards from the salient points. Within the depths decrease to from 20 to 10 fathoms (36.6 to 18.3 m.).

**Anchorage.**—The best anchorage is off the town in a depth of from 14 to 16 fathoms (25.6 to 29.3 m.), or nearer the shore, according to the length and draft of the vessel; the depth is 5 fathoms (9.1 m.) with the gray bathing house southward of Rudha na Leip just open southeastward of the point eastward of Mishnish Pier, which is marked by a flagstaff.

The holding ground westward of Calve Island toward Doirlinn is not so good as that near the town.

**Piers.**—There are three stone piers at Tobermory; of these the eastern or Mishnish Pier has 8 feet (2.4 m.) alongside at low water; the middle pier is about 100 yards in length and there is a depth of 10 feet (3.1 m.) at high water at its outer end, but at low water it dries for about 60 feet outside it. There is a clock tower at its inner end.

The western pier is in ruins and only available for boats.

**Light.**—A fixed white light with red sectors, 14 feet (4.3 m.) above water, visible 5 miles, is shown from the outer end of the middle pier.

**Communications.**—Tobermory has a postal and telegraph office situated close westward of the Free Church. There is steam communication daily, except Sundays, with Oban, and during summer with the Hebrides. The steamers between Glasgow, Skye, and Stornoway also call twice a week. For a short period in summer the tourist steamer from Oban calls daily at Tobermory. There is also steam communication with Coll and Tiree.

**Coal and supplies.**—Scotch coal sufficient in amount for two or three coasting vessels is generally in stock. Small vessels can coal

alongside Mishnish Pier, but a lighter, laden with coal, is kept afloat, from which vessels can coal at the anchorage.

Supplies of bread, meat, and vegetables are obtainable, and water on application at Mishnish Pier.

**Doirlinn Narrows** ( $56^{\circ} 37' N.$ ,  $6^{\circ} 02' W.$ ), at the southern entrance to the harbor, are 90 yards wide at high water, but at low-water springs the passage dries across, and when the stone of the perch which marks the eastern side of the narrows is awash there are 8 feet (2.4 m.) of water in the channel. A perch stands on a rock, which dries 9 feet (2.7 m.) situated on the western side of the narrows 75 yards southward of the perch on the eastern side; both perches have a ball on the top.

The narrows carry 12 feet (3.7 m.) at high-water springs and 9 feet (2.7 m.) at high-water neaps; the Free Church at Tobermory in range with the western entrance point to Doirlinn,  $300^{\circ}$ , leads through.

Doirlinn Narrows are convenient for small vessels near high water, as during a southwesterly gale, when squalls are frequent and heavy, they have great difficulty in working up to the anchorage from Rudh an Righ.

**Tides.**—It is high water, full and change at Mishnish Pier at 5h. 31m.; springs rise  $14\frac{1}{4}$  feet, neaps 10 feet; neaps range 5-feet.

Tobermory Harbor is free from tidal currents, except in the Doirlinn Narrows, where the current sets weakly northwestward with the rising, and southeastward with the falling, tide.

**The western shore** of the sound, southward of Doirlinn Narrows, curves to the southward, and is generally bold, being backed by steep, wooded cliffs.

**Rock.**—A rock, with  $4\frac{1}{2}$  fathoms (8.2 m.) water, lies  $\frac{1}{2}$  mile southward of Doirlinn Narrows at about 200 yards from the shore.

**Rudh an t Sean Chaisteil**,  $2\frac{1}{4}$  miles southeastward of Doirlinn Narrows, is a small projection rising to a grassy mound about 50 feet (15.2 m.) high faced by low cliffs and nearly steep-to. About 300 yards southward of it are the ruins of an old castle, and Ardna-cross, a conspicuous farmhouse, stands on its southern slope.

**Arla Rock** dries 8 feet (2.4 m.) at low water and lies nearly 200 yards from the shore of the bight southward of Rudh an t Sean Chaisteil; the shore of the bight is mostly foul.

**Anchorage.**—Temporary anchorage may be obtained off this bight in a depth of from 10 to 15 fathoms (18.3 to 27.4 m.) with the Free Church at Salen just open eastward of Rudha and Ealasaid.

**The shore** is fairly bold from this bight southward to Rudha and Ealasaid, a distance of  $1\frac{1}{2}$  miles.

**Rudha and Ealasaid** is the extremity of a small projecting mound on which is a flagstaff; there is a pier in ruins on its northern side. Aros Lodge, a white house, is situated close to the point.

**Salen Bay** is 1 mile wide between Rudha and Ealasaid, its northern point, and Rudha More, its southern extremity; it is shallow, rocky, and only suitable for small vessels with local knowledge.

Aros Castle ( $56^{\circ} 32' \text{ N.}$ ,  $5^{\circ} 58' \text{ W.}$ ), in ruins, is on the point 600 yards southward of Rudha and Ealasaid; there is a flagstaff near it and close inland is Aros Mains, a group of white houses.

Numerous rocks which dry at low water fringe the head of Salen Bay; the outermost of these are marked by iron perch beacons.

Antelope Rock, the eastern of these rocks, has 4 feet (1.2 m.) of water, and lies 300 yards northwestward from the northwestern pier at Rudha More.

Maid of Lorne Rocks, with less than 6 feet (1.8 m.) of water over them, lie 300 yards eastward of Antelope Rock, and 200 yards seaward of the perches marking the outermost drying rocks in the bay.

A  $2\frac{1}{4}$ -fathom (4.1 m.) patch lies 300 yards northwestward of the Maid of Lorne Rocks.

**Buoy.**—A black can buoy is moored in  $4\frac{1}{2}$  fathoms (8.2 m.) of water, close northeastward of Antelope Rock.

**Clearing mark.**—Pennygown in range with the northeastern pier at Rudha More, bearing  $115^{\circ}$ , leads northeastward of all the rocks.

**Anchorage** may be had in Salen Bay westward of the line of the Free Church in range with the northwestern pierhead, in depths of from 10 to 14 fathoms (18.3 to 25.6 m.), but large vessels should not swing southward of the line joining Glenforsa House with Rudha More.

A considerable sea rolls into the bay with northerly and northwesterly gales.

Small vessels can anchor off Aros Castle in 6 fathoms (11 m.) of water, good holding ground, but the depths in this part of the bay decrease rapidly from 5 to 2 fathoms (9.1 to 3.7 m.).

**Tides.**—It is high water, full and change, at Salen Pier at 5h. 27m.; springs rise  $13\frac{3}{4}$  feet, neaps rise  $9\frac{1}{2}$  feet; neaps range  $4\frac{3}{4}$  feet.

The tidal currents in the bay are weak.

**Salen** is a straggling village at the head of the bay. The Free Church with a belfry is in its western part.

The old pier or landing slip for boats, having a white two-storied house at the inner end, extends 150 yards from the shore 300 yards northward of the Free Church, and is the best landing place when the northeastern pier at Rudha More is not available.

The village contains two hotels, an Established Church (which is not visible from the sound), and a Temperance Hall, standing close to the head of the bay.

**Communications.**—There is a postal telegraph office at Salen, the postal address is Aros, Oban. Steam vessels run from and to Glasgow, Skye, and Stornoway twice a week.

**Rudha More** is marked by several houses and two piers project, respectively, northwesterly and northeasterly from it. The northwestern pier is not used, but the northeastern or new pier has a depth of 15 feet (4.5 m.) alongside at low water.

The hospital, some small buildings painted red, is situated on the shore a short distance southward of Rudha More.

**Eileanan Glasa** (Green Island) ( $56^{\circ} 32' N.$ ,  $5^{\circ} 55' W.$ ) is the largest of a group of grass-covered rocks lying in the middle of the sound northeastward of Rudha More; it is 45 feet (13.7 m.) high. The rocks are steep on their northeastern sides.

**Light.**—A flashing white light, 23 feet (7 m.) above water, visible 9 miles, is shown from a white beacon on Dearn Sgeir, the southernmost rock off Eileanan Glasa.

**Rocks.**—Numerous rocks and shoals are situated between Eileanan Glasa and Rudha More; this passage should not be taken without local knowledge.

Bogha, awash at low water, and the shoalest of these rocks, is situated 850 yards eastward of the northeastern pier at Rudha More.

**Buoy.**—A red conical buoy is moored in 3 fathoms (5.5 m.) of water on the southern side of the shoals extending from Bogha.

**Clearing marks.**—A patch of white cliff on the western shore of Salen Bay just open of the northeastern pier at Rudha More,  $277^{\circ}$ , leads southward of these rocks in a depth of 3 fathoms (5.5 m.). This mark requires local knowledge, as it leads into shoal water both off Rudha More and Forsa River.

The Free Church at Salen, in range with the northwestern pier-head at Rudha More,  $212^{\circ}$ , leads northwestward of these shoals.

**Forsa River**, a considerable stream, flows into the sound about 1 mile southeastward of Rudha More, and there is a bank of shingle at its mouth.

Glenforsa House, a conspicuous building, stands on the shore nearly  $\frac{1}{2}$  mile westward of its entrance, and Pennygown, a group of farm buildings, is situated 600 yards to the southward.

**The shore** between Forsa River and Rudha na Leireach, a distance of  $1\frac{3}{4}$  miles, should not be approached nearer than 400 yards.

Sgeir Ghlas, which dries 8 feet (2.4 m.) at low water, lies 800 yards northwestward of Rudha na Leireach and nearly 200 yards off-

shore; 2 rocks, which dry respectively 9 and 5 feet (2.7 and 1.5 m.), are situated close westward of that point and about 150 yards offshore.

**Fishnish Bay** lies between Rudha na Leitreach and Fishnish Point. A farmhouse, with a high barn near it, stands at the head of the bay, and Corrynachenchy, a white building, is situated on the hillside a short distance westward of it.

The depths in the bay decrease rapidly from 10 fathoms (18.3 m.) to the low-water line.

**Anchorage** may be obtained in a depth of 16 fathoms (29.3 m.) with Lochaline pier in range with Fishnish Point,  $54^{\circ}$ , and the farmhouse at the head of the bay bearing  $155^{\circ}$ .

Vessels of light draft can anchor nearer in, but the 5-fathom (9.1 m.) curve is only about 200 yards from the low-water line.

**The shore** from Fishnish Bay ( $56^{\circ} 31' N.$ ,  $5^{\circ} 50' W.$ ) trends southeastward about 1 mile to Rudha Leth Thorcaill, which rises at a short distance inland to a small peaked mound 90 feet (27.4 m.) high, and further inland to Cnoc an Teine, a conical hill 215 feet (65.5 m.) high. Two conspicuous trees stand on the plateau between these hills, and there is a shed with a zinc roof close southward of them. The water is deep 250 yards off this shore.

The shore from Rudha Leth Thorcaill trends southward about  $2\frac{3}{4}$  miles, when it turns eastward to Scallastle Point.

**Rocks.**—A rock, with  $2\frac{3}{4}$  fathoms (5 m.) of water, is situated 350 yards  $95^{\circ}$  from Rudha Leth Thorcaill, and a rock, with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, 600 yards  $134^{\circ}$  from the same point.

**Avon Rock** is a small patch, with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, lying nearly  $\frac{1}{2}$  mile southeastward of Rudha Leth Thorcaill.

**Buoy.**—A black can buoy is moored in 11 fathoms (20.1 m.) of water, close northeastward of Avon Rock.

**Clearing marks.**—Duart Point Castle, open eastward of Scallastle Point, bearing  $131^{\circ}$ , leads eastward of Avon Rock, and Rudha na Leitreach, open northward of Rudha Leth Thorcaill, bearing  $279^{\circ}$ , leads northward.

**Ban Eileanan** are two small islets covered with grass, the northern of which, situated close to the low-water line about 600 yards northward of Garmony Point, is 8 feet (2.4 m.) high.

**Scallastle Bay** lies between Garmony and Scallastle Points. Garmony Point is low and shingle. Garmony, a conspicuous house with a prominent belt of trees, stands nearly  $\frac{1}{2}$  mile within Garmony Point.

The northwestern part of Scallastle Bay contains numerous shoals. The two conspicuous trees under Cnoc an Teine, open northward of Ban Eileanan, bearing  $302^{\circ}$ , leads northeastward of them.

A white schoolhouse stands on the southern shore of the bay, with Scallastle Farm about 800 yards southeastward of it. A small golf pavilion is situated about 200 yards inland, 800 yards westward of Scallastle Point.

**Shoal.**—A shoal, with 2 fathoms (3.7 m.) of water, is situated in the eastern part of Scallastle Bay, with the schoolhouse bearing  $251^{\circ}$ , distant 700 yards.

**Clearing mark.**—The summit of Glas Eileanan (Grey Islets) open northward of the northern extremity of Sgeir nan Gobhar, bearing  $57^{\circ}$ , leads northward of this shoal.

**Anchorage** may be obtained in Scallastle Bay, in a depth of 9 fathoms (16.5 m.), good holding ground, with Rudha an Ridire open northward of the summit of Sgeir nan Gobhar, bearing  $85^{\circ}$ , and the schoolhouse bearing  $183^{\circ}$ .

**Scallastle Point** ( $56^{\circ} 29' N.$ ,  $5^{\circ} 43' W.$ ) rises  $\frac{1}{4}$  mile inland to Druim an Dhubhair, a rocky mound, 82 feet (25 m.) high, covered with trees.

**Sgeir nan Gobhar** (Goat Island), 5 feet (1.5 m.) high, is the highest of a group of rocky islets lying within the distance of 800 yards northward of Scallastle Point.

**Rocks.**—A rock with  $2\frac{1}{2}$  fathoms (4.6 m.) of water and a rock with  $4\frac{1}{4}$  fathoms (7.8 m.) of water, bear  $291^{\circ}$ , distant 500 and 850 yards, respectively, from the summit of Sgeir nan Gobhar.

A rock, with  $2\frac{3}{4}$  fathoms (5 m.) water, lies 400 yards  $240^{\circ}$  from Sgeir nan Gobhar.

**Yule Rocks** are a group occupying a space 200 yards in extent; the shoalest of these rocks has 4 feet (1.2 m.) water and is situated 1,500 yards  $284^{\circ}$  from Glas Eileanan Lighthouse.

**Buoy.**—A black can buoy is moored in  $4\frac{1}{4}$  fathoms (7.8 m.) of water close northward of Yule Rocks.

**Clearing mark.**—Lismore Lighthouse open northeastward of Glas Eileanan leads northeastward of Yule Rocks.

**Glas Eileanan** (Grey Islets) ( $56^{\circ} 32' N.$ ,  $5^{\circ} 55' W.$ ) are a small group situated in mid-channel, the highest of which is 14 feet (4.3 m.) high and has a hut on it.

**Light.**—A flashing white light, 34 feet (10.4 m.) above high water, visible 10 miles, is shown from a white cylinder on a white masonry base, 22 feet (6.7 m.) above water, on the eastern islet.

**Shoals** extend nearly  $\frac{1}{4}$  mile northwestward, and over 600 yards southeastward from Glas Eileanan.

A rock, with  $2\frac{1}{2}$  fathoms (4.6 m.) of water, lies 200 yards northeastward from the eastern islet. Lochaline Pier, shut in by Ard-tornish Point, leads eastward of this rock.

The bottom in the vicinity is very uneven.

**Caution.**—The passage between Glas Eileanan and Sgeir nan Gobhar requires local knowledge; the broader and deeper channel on the eastern side of the islets should be considered the fairway.

**Anchorage.**—Temporary anchorage may be obtained on the plateau southward of Glas Eileanan, in depths of from 12 to 14 fathoms (21.9 to 25.6 m.), but not northwestward of the range of the house in Inninmore Bay well open southeastward of the islets.

**Auliston Point** (Rudha na n'Auliston), situated on the southern side of the entrance to Loch Sunart from the Sound of Mull, terminates in low islets from which sunken ledges extend 100 yards.

The shore southward of Auliston Point is fringed by rocks, which dry at low water, and should not be approached within a distance of 400 yards.

Sgeir Chorrach, a small islet about 5 feet (1.5 m.) high, lies 1,700 yards southward of Auliston Point.

St. Columba's Chapel, with a square tower, on a hill close to the shore about  $1\frac{3}{4}$  miles southward from Auliston Point, is conspicuous; Drimnin House, situated near this chapel, is only visible through the surrounding trees on some bearings.

Rudh' an Duin Bhain is a small peninsula southwestward of St. Columba's Chapel, and there is a white bathing house on its southern side.

**Bonnavoulin** ( $56^{\circ} 37' N.$ ,  $5^{\circ} 59' W.$ ), a small village with a conspicuous row of white cottages, is situated in a bight about 1 mile southward of St. Columba's Chapel, the intervening shore being fringed by rocks to the distance of 200 yards.

A small pier in the northern part of the bight has a depth of 8 feet (2.4 m.) alongside at high-water springs.

There are several shoals in the southern part of the bight.

**Rock.**—A rock, which dries 2 feet (0.6 m.), is situated about 100 yards southwestward of the northern point of the bight.

Dun Ban Point, open westward of the point under Morven Kirk, bearing  $150^{\circ}$ , leads close westward of this rock.

**Anchorage.**—Temporary anchorage may be obtained off Bonnavoulin, in a depth of from 10 to 14 fathoms (18.3 to 25.6 m.), with the western end of the row of white cottages bearing  $70^{\circ}$ , and Big Stirk just shut in by Rudh' an Duin Bhain.

**Communication.**—The mail steamer calls daily, weather permitting, and there is a postal telegraph office close northward of the pier. The postal address is Drimnin, Argyllshire.

The shore from Bonnavoulin Bight to Caisteal nan Con, a distance of 3 miles, is mostly foul; Bogha Bhuilg, the outer rock which dries, is 300 yards offshore  $\frac{1}{2}$  mile southward of Bonnavoulin.

**Buoy.**—A red conical buoy is moored close westward of a rock  $1\frac{1}{2}$  fathoms (2.7 m.) water, situated about 150 yards westward of Bogha Bhuilg.

**Shoal.**—A shoal with  $4\frac{1}{4}$  fathoms (7.8 m.) water lies about 150 yards southwestward of this buoy.

**Clearing mark.**—Big Stirk open westward of Rudh' an Duin Bhain, bearing  $335^\circ$ , leads westward of all these shoals.

**Morven Kirk**, with a belfry, is conspicuous on the hillside  $\frac{3}{4}$  mile southeastward of Bonnavoulin.

Glenmorven cottage, two-storied, stands close to the shore 800 yards southward of Morven Kirk.

A conspicuous flagstaff stands near the shore close to Glenmorven cottage.

**Killundine River**, a considerable stream, flows into the sound about  $2\frac{1}{2}$  miles southeastward of Bonnavoulin, and a shoal of shingle has formed at its mouth; a boathouse with a red roof stands on the northern side of the entrance.

Killundine House, a prominent two-storied building, is situated on the slope of the hills about  $\frac{1}{2}$  mile southeastward of Killundine River.

**Rocks.**—Between Dun Ban and Caisteal nan Con, 1.3 miles to the southward, a bank with irregular depths, and on which are several rocks, extends in places to a distance of 700 yards from the shore.

The outer rock on this bank has a depth of 4 fathoms (7.3 m.) and from it Caisteal nan Con bears  $114^\circ$  distant nearly 1,400 yards.

There is also a  $2\frac{1}{2}$  fathom (4.6 m.) patch midway between the above shoal and the shore.

**Caisteal nan Con** ( $56^\circ 34' N., 5^\circ 56' W.$ ), in ruins, stands on a small projection  $\frac{1}{2}$  mile southward of Killundine River.

There is a boathouse close in-shore of it.

**Sgeir Con**, a rock with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, lies 350 yards northwestward of Caisteal nan Con; and a shoal of  $3\frac{1}{2}$  fathoms (6.4 m.) lies 150 yards southward of it.

**Leading mark.**—Ben nan Ord, a conical hill near Ben na Seilg, in range with the east fall of Druin Nead an Fhireoin, bearing  $316^\circ$  leads westward of all shoals southwestward of Dun Ban.

**Ru Aird Seisg**,  $1\frac{1}{2}$  miles southward of Caisteal nan Con, is steep-to.

Clach na Criche (Wishing Stone), a remarkable termination of a trap dike, is situated 300 yards southeastward of the point.

**Camus Shalachain** is a small light close eastward of Ru Aird Seisg.

A white house with a tower, and the manse, a two-storied building almost hidden by the trees, are situated a little within the bight.

**Fiunary Rocks** are several islets and rocks which dry or are covered at low water; the southern rock has a depth of 5 feet (1.5 m.).



These shoals extend 600 yards from the eastern shore of Camus Shalachain.

**Buoy.**—A red conical buoy is moored 200 yards westward of the southern rock.

**Eilean na Bithheiche**, the southeastern entrance point of the bight, is a grassy island with a flagstaff on its summit; there is a boathouse near its eastern end.

**The shore** eastward of Eilean na Beitheiche ( $56^{\circ} 33' \text{ N.}$ ,  $5^{\circ} 52' \text{ W.}$ ) is fairly bold for a distance of nearly a mile to Savary Bay, at the entrance to Savary River, where there is a shoal of shingle.

**Sgeir Savary**, a rock at the southwestern edge of this shoal, dries at low water, and is marked by an iron perch.

**The shore** southeastward of Savary River to Rudha Dearg, a distance of  $1\frac{1}{4}$  miles, should not be approached nearer than 400 yards, but between Eilean na Beitheiche and Rudha Dearg a plateau extends about 700 yards offshore, on which outside the shoal water temporary anchorage may be obtained in depths of from 13 to 16 fathoms (23.8 to 29.3 m.).

**Rock.**—A rock, with  $2\frac{3}{4}$  fathoms (5 m.) of water, lies 250 yards off the shore, 600 yards northwestward from Rudha Dearg.

**Pier.**—Lochaline (stone) Pier projects from the western entrance point of Loch Aline, and there is a depth of  $9\frac{1}{2}$  feet (2.9 m.) at low water alongside it.

A small church with a belfry stands on the hillside  $\frac{1}{2}$  mile to the northward.

A war memorial cross, 30 feet (9.1 m.) in height, stands on the western point of Loch Aline at an elevation of 94 feet (28.6 m.).

**Communications.**—There is a postal telegraph office at the inner end of the pier; both the pier and office are noticeable from a distance. The mail steamers call here.

**Bogha Lurcain**, a rock which dries at low water, lies close to Bolorkle Point, the eastern entrance point of Loch Aline, and is marked by an iron perch, surmounted by a barrel, all painted red.

**Ardtornish Point** is steep-to and wooded on its southern slope. Ardtornish Castle, a ruin, the top of which is 105 feet (32 m.) above high water, is on the point.

**Ardtornish Bay** is eastward of Ardtornish Point; at the entrance the depths rapidly decrease from 20 fathoms to 7 fathoms (36.6 to 12.8 m.); the bottom is generally even from between the entrance points for a distance of 400 yards to the 5-fathom (9.1 m.) curve, inshore of which the depths decrease gradually.

A small quay, with a depth of 2 feet (0.6 m.) alongside it at low water, projects from the western side of the bay 600 yards within Ardtornish Point; Inninbeg, a small cottage, stands close to the shore at the head of the bay.

**Rudha an t Sasunnaich** (Englishman's Point) is the eastern point of the bay, and from it shoal water extends westward 350 yards, and there is a rock with 5 feet (1.5 m.) water near its outer end.

Nearly 200 yards northwestward of the 5-foot (1.5 m.) rock is a rock with  $4\frac{1}{2}$  fathoms (8.2 m.) of water, and 600 yards northwestward from Rudha an t Sasunnaich is a patch of 5 fathoms (9.1 m.).

**Anchorage** may be obtained with offshore winds in depths of 7 fathoms (12.8 m.) with Inninbeg bearing  $340^\circ$  and the shed with a zinc roof near Rudha Leth Thorcail just shut in by Ardtornish Point bearing  $251^\circ$ .

**The shore** from Ardtornish Bay to Inninmore Bay, a distance of about 2 miles, rises in basaltic cliffs to the height of 700 feet (213.4 m.). Within these cliffs 1.2 miles northeastward from Rudha an t Sasunnaich is Glais Ben, 1,567 feet (477.6 m.) high, the Table of Lorn, a remarkable plateau 1,350 feet (411.5 m.) high, with vertical sides, being on its eastern slope.

**Inninmore Bay** lies between Rudha an t Sasunnaich and Eilean Rudha an Ridire. Inninmore is a small cottage standing in a ravine at the head of the bay.

**Anchorage** may be obtained with offshore winds in depths of from 9 to 14 fathoms (16.5 to 25.6 m.), keeping the inn at Craignure open westward of Eilean Rudha an Ridire.

**Eilean Rudha an Ridire** is a small gray island, separated from Rudha an Ridire by a channel 100 yards wide. Rocks above and below water extend 200 yards northward from the island, and a rock, with  $2\frac{1}{2}$  fathoms (4.6 m.) of water, lies 200 yards southward of the island.

**Rudha an Ridire** ( $56^\circ 30' N.$ ,  $5^\circ 41' W.$ ), the eastern point of the southern entrance to the Sound of Mull, is nearly steep-to. The land here turns sharply eastward and is the northern shore of the Lynn of Morven.

**Tidal currents.**—In the Sound of Mull the current runs northwestward with the rising and southeastward with the falling tide; but although it is high water, full and change, simultaneously at about 5h. 27m., the northwest-going current begins an hour earlier in the northwestern end of the sound than it does in the southeastern end.

The northwest-going current begins at New Rocks at  $5\frac{1}{4}$  hours after high water and runs for  $6\frac{3}{4}$  hours, while off Duart Point it does not begin till  $5\frac{3}{4}$  hours before high water, and runs for 6 hours. The southeast-going current begins almost simultaneously throughout the sound at about three-fourths hour after high water.

The currents take the general direction of the shores on each side, the northwest-going current attaining a rate of 2 knots, and the

southeast-going of  $2\frac{1}{2}$  knots, at springs. During the strength of the currents swirls form round Rudha nan Gall, Rudha an t Sean Chaisteil, Ardtornish Point, and in the narrows off Glas Eileanan, and occasionally there are races near Glas Eileanan and the Yule Rocks. In the several bights between the salient points on each side there is but little current.

In the northwestern entrance the direction and rate of the current is much influenced by the current setting into and out of Loch Sunart, but their rate is moderate, from  $\frac{1}{2}$  to 1 knot at springs; thus near the New Rocks the southeast-going current at first sets southeastward and turns gradually southward, southwestward, and westward until the northwest-going current begins, the greatest rate being  $\frac{1}{2}$  knot.

At the northern end of the bank off Red Rocks the current is of a rotatory character, running northwestward at  $5\frac{1}{4}$  hours before high water and gradually turning northward and northeastward, with a rate of  $\frac{3}{4}$  knot, until one-fourth hour after high water, when it turns eastward and gradually continues its rotatory motion through southeast, south, and southwest, until it is again setting northwestward at  $5\frac{1}{4}$  hours after high water, the greatest rate of the current being  $\frac{1}{2}$  knot.

The northwest-going current on issuing from the sound combines with the current northeastward outside the Island of Mull, and both move toward Ardnamurchan Point.

**Directions.**—On entering the northwestern entrance to the Sound of Mull ( $56^{\circ} 40' N.$ ,  $6^{\circ} 08' W.$ ), steer to pass about 600 yards off Rudha nan Gall, leaving New Rocks Buoy to the eastward and observing the clearing marks for the New Rocks and adjacent shoals. The summit of Ben na Selig, the highest of the Ardnamurchan range,  $318^{\circ}$ , leads in mid-channel between Rudha nan Gall Lighthouse and the New Rocks till abreast the southern end of Calve Island. Sailing vessels are recommended to keep on this range, especially during light winds, in preference to closing the high land of Mull, where alternate calms and baffling airs prevail.

Southward of Calve Island keep in mid-channel, avoiding Bogha Bhuilg, marked by a red conical buoy, and the shoal ground in its vicinity, and pass about  $\frac{1}{4}$  mile northeastward of Eileanan Glasa Light Beacon. Then steer toward Ardtornish Point, and when that point is distant about 1 mile steer east-southeastward through the fairway between Glas Eileanan and Eilean Rudha an Ridire. Duart Point Castle open eastward of Scallastle Point leads eastward of Avon Rock, and Lismore Lighthouse open northeastward of Glas Eileanan, leads northeastward of Yule Rocks. Each of these rocks is marked by a black buoy.

At night, from about  $\frac{1}{2}$  mile northward of Ardmore Point, steer to pass about  $\frac{1}{4}$  mile off Rudha nan Gall Light, close to which the water is deep. The light shows red to the westward, green over New, Red, and Stirk Rocks, and white to the southward. The high land on the northern side of Tobermory Harbor is steep and bold; on rounding it the pier light is a guide for anchoring in the harbor.

Southward of Rudha nan Gall the lights of Eileanan Glasa and Glas Eileanan are good guides through the sound.

**Loch Aline.**—The entrance to Loch Aline,  $3\frac{1}{2}$  miles within the southern entrance to the Sound of Mull, and 1 mile northward of Ardtornish Point, is very narrow, being at one place only 150 yards across at low water, with a depth of 24 fathoms (43.9 m.) immediately outside, and a mid-channel depth of from 3 fathoms (5.5 m.) at the outer part to 6 feet (1.8 m.) on the bar at the inner end of the narrows. Within the narrows, which are about 600 yards long, the loch opens to a width of  $\frac{1}{2}$  mile, with central depth of from 16 to 20 fathoms (29.3 to 36.6 m.), decreasing gradually toward each shore, and also toward the head of the loch, where there is a depth of  $3\frac{1}{2}$  fathoms (6.4 m.) within a few yards of the low-water line, about  $1\frac{1}{4}$  miles above the bar. The loch trends north-eastward  $1\frac{3}{4}$  miles from the bar, but, at low water, this distance is decreased about  $\frac{1}{2}$  mile by the drying of a bank of gravel and bowlders, brought down by the mountain streams of Kinlochaline and Rannoch, both of which enter the head of the loch and are crossed by bridges near their mouths.

Near the mouth of Kinlochaline Water are the remains of Kinlochaline Castle ( $56^{\circ} 34' \text{ N.}, 5^{\circ} 45' \text{ W.}$ ), while near Rannoch River is a handsome mansion, with a lofty square clock tower. The village is on the western side of the entrance to the loch, and a long row of cottages is on the brae above. A white house, two-storied and conspicuous, stands near the shore, and close to it is a stone pier, where there is a depth of 18 feet (5.5 m.) at high water, and where water can be obtained free of charge. A ferry plies across the entrance.

**Directions.**—Enter Loch Aline with two white beacons, situated on the western shore within the narrows, in range  $356^{\circ}$ , which leads to the westward of Bogha Lurcain and through the outer and middle portion of the narrows, in a least depth of 12 feet (3.7 m.). Then keep in mid-channel and, having crossed the bar, haul to the eastward and anchor in 8 or 10 fathoms (14.6 to 18.3 m.) off the eastern shore. Small vessels generally anchor off the western shore, near an old limekiln, a position more convenient for communicating with the village.

**Tides.**—It is high water, full and change, in Loch Aline at 5h. 33m.; springs rise  $13\frac{3}{4}$  feet, neaps  $10\frac{1}{2}$  feet. During springs both currents attain a rate of  $2\frac{1}{2}$  knots in the narrows; and, after a continuance of rain, the rate of the outgoing current is much greater.

**Loch Sunart.**—The entrance to this loch is 2 miles wide between Auliston Point and Maclean's Nose, and the loch extends inland in a tortuous but general easterly direction for about 19 miles to its head, where it is separated from Loch Linnhe by a neck of land  $4\frac{1}{4}$  miles wide. It is inclosed by hills and mountains of varied outline and character, the most remarkable being Ben Resipol, which rises to a height of 2,767 feet (843.4 m.) 3 miles northward of the loch 4 miles from its head.

**Depths.**—The depths for about 10 miles within the entrance are from 35 to 67 fathoms (64 to 122.5 m.), decreasing in places to from 50 to 12 fathoms (91.4 to 21.9 m.), with very irregular bottom northward of Oronsay and Carna.

In Laudale Narrows ( $56^{\circ} 41' N.$ ,  $5^{\circ} 40' W.$ ) the least water in the fairway is 3 fathoms (5.5 m.), with 5 fathoms (9.1 m.) in the narrowest part. Inside the narrows the depth again increases to about 50 fathoms (91.4 m.), but beyond this the water gradually shoals, there being 10 fathoms (18.3 m.) about 1 mile from the head, and from 3 to 6 fathoms (5.5 to 11 m.) 400 yards from the low-water mark at the head.

**Anchorage.**—The principal anchorages are Glenmore Bay; Loch na Droma Buidhe; the bight between Oronsay and Carna; and, farther up the loch, Salen Bay; the bight northward of Rudha an Daimh, 1 mile from Laudale Narrows and Camus na Haorie, nearly 2 miles beyond those narrows.

**Northern shore.**—**Rudha Aird Shlignich** lies nearly 2 miles  $105^{\circ}$  from Maclean's Nose. Between them is Camus nan Geall, a small bight open to southwesterly winds, with a depth of 20 fathoms (36.6 m.) at its entrance. A rocky spur dries about 200 yards off the western point of the bay, and 400 yards farther westward is a rock awash at high water, over 200 yards from the shore.

**Slignach More**, a detached rocky reef, 2 feet (0.6 m.) high, lies  $\frac{1}{4}$  mile southwestward of Rudha Aird Shlignich; the rock is only about 200 yards in extent at high water, but its size is 400 yards at low water, with deep water around. The passage between it and the point is clear, with from 10 to 25 fathoms (18.3 to 45.7 m.) water.

**Slignach Beg**, a cluster of rocks 300 yards in extent, which covers at high water, lies 600 yards westward from Slignach More, with a deep-water passage between. There are from 20 to 28 fathoms (36.6 to 51.2 m.) close around the cluster.

Risga Peak in range with the north high-water line of Oronsay, 84°, leads northward of the Red Rocks, but very close southward of Slignach Beg and Slignach More.

**Eilean More.**—The southern end of this island lies 1 mile eastward from Rudha Aird Schlignich, and its northern end is separated from the shore of the loch by a narrow passage, dry at high water; the island is 127 feet (38.7 m.) high. Between Rudha Aird Shlignich and the island are three small indentations, Camus Ban, Camus Fearna, and Port na Croisg; of these the two last are clear, with depths of about 5 fathoms (9.1 m.) in their middle parts, but the low-water line of Camus Ban dries far out.

**Glenmore Bay** (56° 41' N., 5° 56' W.), eastward of Eilean More, is 600 yards wide at the entrance, and extends northward  $\frac{1}{2}$  mile; there is a broad sandy beach at its head, which dries out nearly 400 yards at low water; the anchorage is in from 5 to 6 fathoms (9.1 to 11 m.) well up the bay and sheltered. A rock has been reported to exist near the head of the bay.

**Risga Island**, 1,400 yards southeastward from Rudha Aird Druimnich, the eastern entrance point of Glenmore Bay, is about 600 yards long, and rises at its northern end to a peak 138 feet (42.1 m.) high; it lies between the northern extremes of Oronsay and Carna, and on its northern side is separated from Eilean an Fiaigh, which at low water is joined to the mainland by a channel with from 6 to 9 fathoms (11 to 16.5 m.) of water; this channel is used by the local traffic, but is too narrow to be safe for a stranger.

**Rock.**—A rock, with  $1\frac{1}{4}$  fathoms (2.3 m.) of water, about 40 yards in extent east and west, lies with the summit of Risga bearing 100°, distant 550 yards. The northern point of Carna well open of Risga, 98°, leads northward of the rock.

**Ross Rock**, 130 yards in extent, with 2 feet (0.6 m.) least water, lies 300 yards westward of the southern extremity of Risga, with 11 fathoms (20.1 m.) of water between. The third shoulder of Rudha Aird Shlignich in range with the northern high-water mark of Oronsay, 283°, leads southward of the rock.

**Southern shore.**—The shore from Auliston Point to Torr nan Con (Dog Hill), a headland on the southern side of the entrance to Loch na Droma Buidhe, trends eastward for  $1\frac{3}{4}$  miles, making a slight bay; it is steep-to, except toward its eastern end, where the 5-fathom (9.1 m.) curve is about 200 yards off-shore.

**Loch na Droma Buidhe**, between Oronsay and the mainland to the southward, affords safe anchorage, and is frequently used by vessels from the northward when unable to work into Tobermory against strong southwesterly winds. The entrance between the western end of Oronsay and Torr nan Con is 150 yards wide, and

these narrows extend eastward about 600 yards, the shores being steep-to, with from 4 to 10 fathoms (7.3 to 18.3 m.) of water. To enter, keep in mid-channel until the loch begins to open out, and then close the island to avoid a rock, with 3 feet (0.9 m.) water, which lies off the eastern end of the narrows, on a spit extending nearly 200 yards from the southern shore.

The anchorage is in the western corner of the loch, in about 10 fathoms (18.3 m.) mud.

**Oronsay** ( $56^{\circ} 40' \text{ N.}$ ,  $5^{\circ} 55' \text{ W.}$ ),  $1\frac{3}{4}$  miles eastward of Auliston Point, is  $1\frac{1}{2}$  miles long east and west,  $\frac{3}{4}$  mile wide, and of irregular shape, with several deep indentations. The western end is separated from the steep bluff of the mainland under Torr nan Con by the entrance to Loch na Droma Buidhe. The eastern end of the island is connected to the mainland at low water. Sgeirean Glas, a rocky ledge which covers, extends 150 yards off the middle of the three points of the northern side of the island.

Bo Carach, a small rock which dries 3 feet (0.9 m.) lies 200 yards northward of the western point of Oronsay.

**Oronsay Rocks**, about 200 yards in extent, with  $1\frac{1}{4}$  fathoms (2.3 m.) least water, lie 400 yards offshore about midway between the western and northern points of Oronsay, with a passage inside them. Glenborrodale Castle, on the northern shore of Loch Sunart, open of the high-water mark of Creag nan Sgarbh, the northern point of Oronsay,  $67^{\circ}$ , leads northward of the rocks.

**Anchorage.**—Eastward of the eastern end of Oronsay is a snug anchorage in 6 to 7 fathoms (11 to 12.8 m.), mud, tenacious holding ground. This anchorage is in many respects preferable to Loch na Droma Buidhe as a place of refuge, as, for a sailing vessel, egress is easier.

**Carna**, an island about  $1\frac{1}{4}$  miles long northeast and southwest and 561 feet (171 m.) high, narrows the channel northward of it to 300 yards between the 5-fathom (9.1 m.) curve.

**Loch Teachdalsh** extends inland to the southeastward about  $2\frac{3}{4}$  miles, but the southern end of Carna Island extends wedgelike into the entrance and so completely blocks it as to render the loch accessible only to barges or very small vessels of light draft through a narrow channel on each side of Carna Island, both of which are studded with rocks.

**Broad Rock.**—The channel between Risga and Carna Islands is 750 yards wide, but Broad Rock, lying in mid-channel, is a small pinnacle with  $\frac{3}{4}$  fathom (1.4 m.) water and deep water around. There is no good mark for clearing it.

At 1 mile northeastward of Carna Island and on the northern shore is Laga Bay, Eilean na Gilleann, a little rocky islet almost connected with the shore, being the western entrance point. At 600

yards southeastward of Eilean na Gillean is Dun Ghallain, a larger islet, also connected with the shore at low water. On this islet are the ruins of an old castle.

**Dun Ghallain Rock**, with 3 feet (0.9 m.) least water, lies nearly 200 yards off Dun Ghallain Islet. Risga Peak, in range with the northern end of Carna 274°, leads southward of the rock.

**The northern shore** of the loch from Dun Ghallain trends northeastward 3 miles to Rudha Bhualte, the western point of Salen Bay. It is steep-to.

**Salen Bay** (56° 42' N., 5° 47' W.) extends northward  $\frac{1}{2}$  mile and is about 600 yards wide between the entrance points, but a rocky ledge projects 100 yards from the eastern point. There is a pier on the western shore of the bay 400 yards within Rudha Bhualte. About halfway up the bay and nearly in mid-channel is a large rock which dries 3 feet (0.9 m.), narrowing the 4-fathom (7.3 m.) channel on its eastern side to about 100 yards. Northward of the rock and just beyond a stone pier on the western side there is a snug little anchorage in from 4 to 6 fathoms (7.3 to 11 m.) good holding ground. The little scattered hamlet of Salen is often visited by fishermen, and there is frequent communication between it and Loch Moidart via Shiel Bridge, the latter distant  $2\frac{1}{4}$  miles from Salen. The mail steamer from Oban calls twice weekly.

Half a mile eastward of Salen bay is Rudha Aird Beithe, and 900 yards from it on the southern shore is Rudha Aird Eanaich, close off which are two rocks dry at low water.

**Rocks.**—Eilean mo Shlinneaig, a small islet, lies about 1,800 yards southeastward of Rudha Aird Eanaich, and from it more or less broken rocky reefs extend northward 600 yards, ending in a patch with  $21\frac{1}{2}$  fathoms (4.6 m.) water; a patch with 3 feet (0.9 m.) water is situated nearly 200 yards within their outer end. The southwestern shoulder of Eilean Garbh in range with the hollow of the trees of Rudha an Daimh, 117°, leads northeastward of the reefs.

**Eilean Garbh**, on the northern shore, about  $2\frac{1}{2}$  miles above Rudha Aird Beithe, is nearly 400 yards long, and is connected with the mainland by a neck, dry at low water. Northwestward of this island is Eilean a Chuilinn, an islet with a considerable space drying around it at low water, as well as between the islands, and a spit with  $21\frac{1}{2}$  fathoms (4.6 m.) water extends 300 yards southward from the islet. A detached rock, which dries 10 feet (3.1 m.) lies 200 yards westward from the southern point of Eilean Garbh. The bay between the outer end of Eilean Garbh and Rudha an Daimh affords good sheltered anchorage in about 5 fathoms (9.1 m.) mud and clay, with Eilean mo Shlinneaig shut in with the outer end of Eilean Garbh.



**Sgeir Mhali**, the outer rock of a reef extending 300 yards south-westward of Rudna an Daimh, dries 3 feet (0.9 m.); the navigable channel between it and the broad bank formed by the delta of Laudale River is less than 400 yards wide.

**Laudale Narrows** ( $56^{\circ} 41' N.$ ,  $5^{\circ} 40' W.$ ), nearly 300 yards wide between the small rocky Eilean Glas and Rudha na Clach, is narrowed to 150 yards by the broad bank extending from the latter point and the shore westward of it. There is a bank 400 yards long with  $1\frac{1}{2}$  fathoms (2.7 m.) of water, the northwestern extremity of which lies 500 yards northwestward from Eilean Glas, and, as the currents through the narrows are rapid, the utmost caution is required here, Laudale Bank being steep-to.

**Directions.**—After passing Sgeir Mhali, bring the eastern end of Eilean a Chuilinn in range with the western end of Eilean Garbh,  $321^{\circ}$ , and steer with this mark on until Eileans Glas and More almost touch, when steer to pass close southward of Eileans Glas and More, both of which are steep-to on their southern sides; then proceed in about mid-channel up the loch. The least water through the narrows in this route should be  $2\frac{3}{4}$  fathoms (5 m.).

**Camus na Haorie**, about  $1\frac{3}{4}$  miles eastward of Laudale Narrows on the southern shore, affords good anchorage in 7 fathoms (12.8 m.), mud, 250 yards offshore, with the shop at Strontian in range with Rudha na Stroine.

**Eilean a Mhuirich** lies on the northern shore, 1.3 miles above Laudale Narrows, and the rocky low-water line extends 100 yards from it. From the southern point of this island a bank dries to the northwestward across a bay on the northern shore to a small stone pier or hard, which is used as a landing place; and on its eastern side an extensive bank is formed by silt brought down by the Strontian River, which stream flows through the village of Strontian and falls into the bight between the island and Rudha na Droigh-eann, its eastern point.

**Strontian**, a small village on the Strontian River and near the head of the loch, is only visited by small coasters. In its vicinity are some lead mines. There is good anchorage in from 2 to 5 fathoms (3.7 to 9.1 m.), mud, off a small pier about 400 yards eastward of Rudha na Droigh-eann.

**Tides and tidal currents.**—It is high water, full and change, at Strontian, at 5h. 40m.; springs rise  $13\frac{1}{2}$  feet. The current runs into Loch Sunart from  $5\frac{3}{4}$  hours before until one-fourth hour after high water, and out from one-fourth hour after high water until  $5\frac{3}{4}$  hours before the next high water.

The rate of the currents at the entrance does not exceed 1 knot at springs, and eddies form both on the northern and southern shores during the in-going current. Through the narrows between Carna

and Risga Islands, the in-going current has a rate of 2 knots, and the outgoing current of  $2\frac{1}{2}$  knots. Above Carna the tidal currents are weak until near Laudale Narrows; the in-going current through these narrows has a rate of 3 knots and the outgoing of  $3\frac{1}{2}$  knots at springs; after heavy rains the outgoing current through the narrows is more rapid.

**The north coast of Ardnamurchan** from the lighthouse trends northeastward 2 miles to Ru Sana ( $56^{\circ} 45' N.$ ,  $6^{\circ} 11' W.$ ); it is rocky, rugged, and forms 2 small bays, both open to the northwestward. Bo Kora Ben, a rock with less than 6 feet (1.8 m.) water, lies 400 yards offshore 1,200 yards northeastward of the lighthouse, and several rocks lie within 600 yards of the eastern shore of Sana Bay, the northeastern of the two bays.

**Ru Sana** has an irregular outline forming several lumps, over the hollows between which the top of the lighthouse is occasionally visible from the northeastward.

**Bo ha na Crag**, which dries about 5 feet (1.5 m.), lies  $\frac{1}{4}$  mile northwestward from Craig an Dav, the eastern point of White Sand Bay, eastward of Ru Sana, from which point it is distant about  $1\frac{1}{4}$  miles. Rudha Aird Druimnich, well open of the land, bearing  $83^{\circ}$ , leads northward of the rock. White Sand Bay shows well from the northward and eastward.

**Craig an Dav** is an overhanging cliff about 200 feet (61 m.) high, with bright orange-colored lichens showing in patches over the black rock. Rocks dry 250 yards westward of the foot of the cliff.

**The coast** for 2 miles eastward of Craig an Dav is more or less cliffy, with deep indentations and rugged hills in the background; the cliffs end suddenly about  $\frac{1}{2}$  mile northwestward of Faskadale House, where they are about 300 feet (91.4 m.) high, with a fissure reaching from top to bottom.

Faskadale House, on the shore  $2\frac{1}{4}$  miles eastward of Craig an Dav, is a slated cottage facing northward. Between it and Ru Ardtoe,  $1\frac{1}{2}$  miles to the eastward, the coast forms a bay.

There are many points and small bights between Ru Ardtoe and Rudha Aird Druimnich, a distance of 3 miles to the eastward; the bights are all open and are fringed in many places by rocks. The most projecting point is Ockle Point ( $56^{\circ} 46' N.$ ,  $6^{\circ} 01' W.$ ),  $1\frac{3}{4}$  miles westward of Rudha Aird Druimnich; it presents columnar basaltic cliffs to the northeast, and grassy slopes to the southwest.

The land rises to a considerable height within  $1\frac{1}{2}$  miles of this coast; Meall na Con, 1,424 feet (434 m.) high, being less than  $1\frac{1}{2}$  miles southward of Faskadale House; Ben Leathann, 1,310 feet (399.3 m.) high,  $\frac{3}{4}$  mile southeastward of Meall na Con; and Ben Bhreac, 1,165 feet (355.1 m.) high, about 2 miles southward of

Rudha Aird Druimnich, but only 1 mile from the shore of Loch Ceann Traigh.

**Bo Faskadale** is 2 rocks, 200 yards apart, extending together about 800 yards north and south, with a width of 200 yards, lying 4 miles northeastward of Ru Sana, and 1.8 miles off the land to the southward. The northern head is awash at low water; the southern has 4 feet (1.2 m.) of water.

The Established Manse at Eigg, in range with the eastern point of Eilean Chasgaidh, 339°, leads 1,400 yards eastward of Bo Faskadale; Ardnamurchan Lighthouse just open northward of Ru Sana, 217°, leads 1,600 yards northward of it; Ardnamurchan Light is obscured southeastward of this range.

**Bo Faskadale (Askadill)**—A lightbuoy, painted red, exhibiting a group flashing white light, is moored about 700 yards northward of the northern head of the shoal.

**Elizabeth Rock** is small with 4 feet (1.2 m.) of water, and lies  $\frac{1}{2}$  mile 190° from Bo Faskadale. Westward of the rock there is a depth of 6 fathoms (11 m.) at the distance of 600 yards, while at the same distance southward of it there are 30 fathoms (54.9 m.) of water and upward of 50 fathoms (91.4 m.) halfway between it and the shore, from which the rock is distant 1.3 miles. Between the rock and Bo Faskadale, a distance of 900 yards, there are depths of from 15 to 30 fathoms (27.4 to 54.9 m.). White Sand Bay, just open of Craig an Dav, 240°, leads  $\frac{1}{2}$  mile southward of the rock.

**Rudha Aird Druimnich** (56° 47' N., 5° 58' W.), the projecting point on the western side of Loch Ceann Traigh, shows a decided lump a little inside the point on easterly or westerly bearings; the bottom is very uneven off the point. Bo Carrach, a rock drying 8 feet (2.4 m.), lies 750 yards 50° from Rudha Aird Druimnich, and Bo Ruadh, with 2 feet (0.6 m.) water, lies 800 yards southeastward of Bo Carrach; there are shoal patches of 3 fathoms (5.5 m.) nearly 400 yards outside these rocks. Dorlin House, on the southern shore of Loch Moidart, open northward of Farquhars Point, 97°, leads northward of all these shoals.

**Loch Ceann Traigh** is a wide bay extending southward  $2\frac{1}{4}$  miles from its entrance between Rudha Aird Druimnich and Farquhars Point. It is open to the north and northwest, and has depths of from 25 to 14 fathoms (45.7 to 25.6 m.), sand bottom, decreasing gradually toward the shore at its head. There are many shoal patches in the bay.

Caolas Ardtoe, a channel in the southeastern corner of the bay, leads into Kentry Bay. This channel is 200 feet wide at the entrance, with from 12 to 16 feet (3.7 to 4.9 m.) water, but the greater

part of Caolas Ardtoe and the whole of Kentry Bay dry at low water.

**Sgeir an Eididh**, a bare islet 36 feet (11 m.) high, lies nearly 1 mile southwestward from Farquhars Point, and 400 yards from the eastern shore of Loch Ceann Traigh. It is moderately bold on the western side, but shoals extend 200 yards northward and southward from it, and between it and the shore the water is shoal and the bottom foul.

**Dubh Sgeir**, 3 feet (0.9 m.) high, lies near the head and about 800 yards from the eastern shore of the loch; between it and Sgeir an Eididh are several patches of from 2 to 3 fathoms (3.7 to 5.5 m.), and between Sgeir an Eididh and the entrance to Caolas Ardtoe are several rocks and shoal water.

**Anchorage.**—There is anchorage in from 10 to 7 fathoms (18.3 to 12.8 m.), sand, near the head of the loch, between Dubh Sgeir and the western shore, but the loch can not be recommended as an anchorage at any time, and it is a dangerous place with on-shore winds.

**Loch Moidart.**—**Eilean Shona** lies in an opening in the coast,  $1\frac{3}{4}$  miles wide, between Farquhars Point, which rises to a decided hill 393 feet (119.8 m.) high, and appears like an island from a distance, and Rudha nan Clach Dearga, leaving a narrow and tortuous channel on each side of it. These channels join at the eastern end of the island, which is of triangular shape and about  $2\frac{1}{2}$  miles long. The channel southward of the island is Loch Moidart, that on the northern side being the North Harbor.

Eilean Shona is remarkable for its rocky, rugged appearance, especially on its northern and western sides; it rises in Ben a Bhaillidh to a height of 863 feet (263 m.), but has also several hills 400 to 650 feet (121.9 to 198.1 m.) high.

Dorlin House, a large four-storied house, stands in a bend of the shore, about 2 miles up Loch Moidart on its southern side, and about 300 yards southeastward of it the hills rise to a height of 668 feet (203.6 m.). The old ruined castle of Tioram stands on an islet a little northward of the house, but it is not noticeable from seaward.

**Depths.**—The channels into Loch Moidart, though exceedingly narrow and tortuous, have depths of from 36 to 48 feet (11 to 14.6 m.), decreasing to 30 and 20 feet (9.1 and 6.1 m.) in a basin 250 yards wide about 1,400 yards within the entrance, where there is anchorage with sand bottom. Above this position, though the greater part of the loch dries at low water, there are many places suitable for anchorage, and at high water springs the loch is accessible to vessels of 14 or 15 feet (4.3 or 4.8 m.) draft for about  $2\frac{3}{4}$  miles from its entrance.

**Bogha More**, 400 yards southwestward of the southwestern end of Eilean Shona, to which it is connected by shoal water, dries 1 foot (0.3 m.), and is marked by a small black perch. Shoal water extends 130 yards southward of the rock, and there are 7 fathoms (12.8 m.) in the fairway between it and Eilean Raonuill, 300 yards to the southeast. Dorlin House, in range with the highest part of Eilean Raonuill, leads southwestward of all the rocks off Bogha More.

**Eilean Raonuill** ( $56^{\circ} 47' N.$ ,  $5^{\circ} 53' W.$ ), in the entrance to Loch Moidart, is small, 36 feet (11 m.) high at its western end, with a black cliffy face toward the sea, and prominent. The southern side is steep-to, but rocks extend 130 yards from the eastern point, and a red perch marks a rock 100 yards northeastward of the island.

Two red perches, about 200 yards apart, mark the northern edge of the rocks extending off the southern shore of the loch, 400 yards within Eilean Raonuill. The perches are liable to be washed away.

**Directions.**—The channels into Loch Moidart are so narrow, tortuous, and incumbered by rocks that no attempt should be made to enter without local knowledge.

**Howorth Rock**, with 8 feet (2.4 m.) water, lies  $306^{\circ} \frac{3}{4}$  mile from Rudha Ard a Bhag, the southwestern point of Eilean Shona, and 250 yards westward of the rock is a patch with 18 feet (5.5 m.) least water. Shoal water and a number of rocks, dry at low water, extend 900 yards off the northwest coast of Eilean Shona.

Rudha Phuill Beg in range with the outer extremity of the outer Coille Island,  $43^{\circ}$ , leads northward, and Sgeir an Eididh in range with the western end of the largest or eastern sand in Loch Ceann Traigh,  $166^{\circ}$ , leads westward of Howorth Rock and the 18-foot (5.5 m.) patch westward of it.

**North Harbor** is very narrow and the entrance so beset with rocks that no vessel should attempt to enter without local knowledge. There is, however, a depth of from 18 to 12 feet (5.5 to 3.7 m.) at low water in the channel until the bar is reached, 1,200 yards within the entrance; here the island and mainland are 60 yards apart, and the depth on the bar connecting them is 6 feet (1.8 m.). Above the bar the harbor opens out into a basin  $\frac{1}{2}$  mile long and 300 yards wide, with depths of from 48 to 102 feet (14.6 to 31.1 m.), mud. Above this, the harbor quickly shoals, and Caolas Shona Beg, the narrow channel in the upper reach, is dry throughout at low water and has 6 feet (1.8 m.) at high-water springs. There is no shelter in North Harbor until above the bar.

**Coille Islands** are a cluster of small islets extending  $\frac{1}{2}$  mile from the coast northward of North Harbor; An Glass Eilean ( $56^{\circ} 49' N.$ ,  $5^{\circ} 53' W.$ ), one of the outer of these islets, is 17 feet (5.2 m.) high; their western side is moderately steep-to. Southward of the

Coille Islands and in the entrance to North Harbor are a number of low-water rocks with small heads just above high water.

**Tides and tidal currents.**—It is high water, full and change, in Loch Moidart, at 5h. 44m.; springs rise  $13\frac{1}{2}$  feet, neaps  $9\frac{1}{4}$  feet; neaps range  $4\frac{3}{4}$  feet. The currents run into Loch Moidart with the rising tide, and out during the falling tide. Both currents run strongly in the loch, as well as in North Harbor, but  $\frac{1}{2}$  mile outside the entrances the rate does not exceed 1 knot.

**Red Cow Rock**, which dries 1 foot (0.3 m.), lies about 800 yards northeastward of the Coille Islands and 200 yards from the shore. The top of Ben Hiant, showing over the southern land, in range with the outer Coille Island, leads westward of the rock.

**Buck Rock** lies nearly 200 yards from the shore, 500 yards  $233^\circ$  from Rudha Phuill Beg and dries at half tide.

The top of Samalaman Island, in range with Rudha Phuill Beg  $80^\circ$ , leads northward of the rock.

**Rudha Phuill Beg**, situated nearly  $1\frac{1}{2}$  miles northeastward of the northern entrance point to North Harbor, is a low and ragged point, with rocks, dry at low water, extending nearly 200 yards off it. The land within the point rises gradually but irregularly to the height of about 600 feet (182.9 m.). At  $2\frac{3}{4}$  miles northward of the point is the southern extremity of the Arisaig Promontory, of which Rudh' Arisaig is the western extremity. The coast from Rudha Phuill Beg trends eastward  $2\frac{3}{4}$  miles to the entrance to Loch Ailort. There is always a heavy sea on this coast with on-shore winds.

**Sound of Arisaig** lies between the land, of which Rudha Phuill Beg is the northwestern extremity on the south and the Arisaig Promontory on the north. Its southern shores are generally steep-to, but many rocks and islets lie within 1 mile of its northern shore.

The Ardnish Peninsula, which lies eastward of the sound and between Lochs Ailort and nan Uamh, is generally hilly, but with many valleys and several lochs of considerable size, though it is only  $3\frac{1}{2}$  miles long and 2 miles wide. The neck connecting the peninsula to the mainland is low, 1 mile wide, and a large part of it is occupied by a loch.

**Southern shore.**—**Samalaman Island** ( $56^\circ 50' N.$ ,  $5^\circ 50' W.$ ), 1,200 yards eastward of Rudha Phuill Beg, is about 250 yards in extent, 53 feet (16.2 m.) high, and joined to the mainland at low water. Samalaman House, two storied and slated, lies behind it.

**Camus Glen Uig** is a rocky bay,  $1\frac{1}{4}$  miles from Rudha Phuill Beg. A number of rocks, dry at low water, lie in the middle of the bay, and it only affords good shelter for boats in offshore winds. The Roman Catholic Chapel is on the western side of the bay and visible from the northeastward.

Carn More, a small islet off the eastern point of Camus Glen Uig, is connected with the shore at low water. Ru Goirtean na Caorach, at the entrance to Loch Ailort, is about 1 mile eastward from the islet.

**Loch Ailort.**—The entrance to this loch is 1 mile wide between Ru Goirtean na Caorach and Rudha Coilidh, but some islets and rocks stretch  $\frac{3}{4}$  mile southward from Rudha Coilidh, with Priest Rock 800 yards outside them. Loch Ailort is an excellent harbor for vessels unable to weather Ardnamurchan in a freshening south-westerly gale, when as far south as Eigg or Muck Island, and the islets across its mouth give excellent shelter.

**Eilean na Caolidh**, the northern islet, is about 400 yards long, north and south, and 130 yards from its southeastern point is a rock awash at low water. The islet is separated from Rudha Coilidh by a 2-fathom (3.7 m.) channel less than 200 yards wide, but with an ebb current and a strong westerly wind there is a dangerous sea across it.

**Eilean nan Gobhar** lies about 400 yards southward of Eilean na Caolidh, and nearly midway between Rudha Coilidh and the southern shore; it is 550 yards long, and almost divided into two at high water, the parts being connected by a rough stony beach, which nearly covers. The southwestern part is 130 feet (39.6 m.) high, showing a rocky face to the westward, and on the top are the remains of a vitrified fort. The eastern side dries 100 yards, and a rock with 1 foot (0.3 m.) of water lies 100 yards from the southern point. There is a rock with 6 feet (1.8 m.) of water 100 yards off the northern end of the islet; otherwise the channel between Eileans nan Gobhar and na Caolidh is quite clear.

**Eilean Glas** ( $56^{\circ} 51' N.$ ,  $5^{\circ} 47' W.$ ), a round rocky islet 100 yards in extent, lies 300 yards westward from the southern end of nan Gobhar; the channel between is foul, and a rock, awash at low water, projects rather southward of a line joining the southern extremities of the islets. A reef extends 150 yards westward of Eilean Glas.

**Priest Rock**, 800 yards  $318^{\circ}$  from Eilean Glas, dries  $3\frac{1}{2}$  feet (1.1 m.), and has 12 fathoms (21.9 m.) of water at less than 200 yards to the westward, from 4 to 8 fathoms (7.3 to 14.6 m.) within 350 yards to the northward, and from 9 to 7 fathoms (16.5 to 12.8 m.) between it and the islets.

**Siathan More**, 1,963 feet (598.3 m.) high and  $1\frac{1}{4}$  miles northeastward from the head of Loch nan Uamh, open northwestward of Rudha Coilidh, leads northwestward of the rock, and Roshven House, open either southward or northward of the southwestern part of nan Gobhar, leads southward or northward of the rock.

The Roman Catholic Chapel in Camus Glen Uig in range with the eastern point of that bay leads between Priest Rock and Eilean nan Gobhar.

Roshven House is a handsome building in a bay on the southern shore of Loch Ailort, a short distance inside the entrance, with trees behind, and the manager's house on rising ground above.

A  $6\frac{1}{2}$ -fathom (11.9 m.) patch is situated 1,200 yards westward from Priest Rock.

**The southern shore** of the entrance to Loch Ailort is moderately bold, excepting 2 rocks, a few feet high, extending about 200 yards northward from the northeastern part of Ru Goirtean na Caorach.

**The loch** above Eilean nan Gobhar trends eastward 2 miles, and then turns northeastward  $2\frac{1}{2}$  miles to its head, where it forms a basin  $\frac{1}{2}$  mile in extent, with a depth of 16 fathoms (29.3 m.); but 1 mile within nan Gobhar there is a rocky bar with many rocky heads drying at low water, and 1 fathom (1.8 m.) water in the channels between them, and from this inward the loch becomes intricate, narrow, and shoal in places.

Frosbheinn, a mountain with a rounded top 2,869 feet (874.4 m.) high, lies near the head and on the southern side of the loch, and Ben a Stac, a mountain, with a peaked top, is 1 mile northeastward of it; both are about 1 mile from the shore. Heavy squalls come down from these mountains to the anchorage in southeasterly and easterly gales; and, higher up the loch, with these winds, the squalls are violent and boats should never carry sail.

Lochailort station, on the North British Railway, is situated  $\frac{1}{2}$  mile inland from the head of the loch.

**Anchorage.**—The best anchorage is about 200 yards eastward of Eilean nan Gobhar in 3 to 4 fathoms (5.5 to 7.3 m.), with the Sgor of Eigg over the neck of nan Gobhar,  $282^\circ$ . There is deeper water farther southward, and plenty of room in about 3 to 4 fathoms (5.5 to 7.3 m.) to the eastward, but this position is well sheltered from the swell, and the holding ground, clay under sand, is good.

**Tides and tidal currents.**—It is high water, full and change, at Eilean nan Gobhar at 5h. 30m. The currents run into Loch Ailort during the rising tide, and out during the falling tide; they are strong. During the out-going current in westerly gales the sea breaks right across the entrance. The out-going current is scarcely perceptible 1 mile outside Eilean nan Gobhar.

**Northern shore of the Sound of Arisaig**—Eilean na Ghaill ( $56^\circ 52' \text{ N.}, 5^\circ 54' \text{ W.}$ ), close to the southern coast of the Arisaig promontory, is about 450 yards long north and south, and has a



square clifly top, 70 feet (21.3 m.) high, sloping to the westward, appearing like a ruin from the northwestward; on its northeastern side it affords partial shelter to Port Doire na Dris, a little inlet.

Camus Drollaman, about  $\frac{1}{2}$  mile eastward of Eilean na Ghaill, is a snug little boat harbor, but it dries at low water. Half a mile farther eastward is Camus Leathann, an open bay, with a remarkable long gravelly beach, while a beach lies farther eastward, but is not so noticeable.

**Black Rocks** extend north-northwestward 800 yards along, and from 300 to 200 yards off the land, from about 400 yards westward of Eilean na Ghaill to abreast of Port a Bhathaich; the southern rock is about 10 feet (3.1 m.) high, and of a black appearance.

**Harpy Rock**, 700 yards southeastward from Eilean na Ghaill has two heads 60 yards apart, dry at low water, and covered with long brown seaweed. There are from 2 to 6 fathoms (3.7 to 11 m.) between them and the shore, and 12 fathoms (21.9 m.) outside them.

The outer Black Rock westward of Eilean na Ghaill, open south-westward of that island,  $296^\circ$ , leads southwestward of the rock.

**Eileanan Tri** is a group of 3 islets  $\frac{1}{2}$  mile southward of Eilean na Ghaill, 800 yards east and west. A basaltic pillar forms the highest part of the eastern islet. A small peaked rock which covers at high water lies 100 yards westward of this group.

**The Bellows**, a rock with 4 feet (1.2 m.) of water, said to break except in fine weather, is situated nearly 400 yards to the southward of the western Tri.

Eilean na Ghaill open northwestward of the western Tri leads northwestward, and Ru Farm Cottages in range with the peaked rock leads westward of it.

**Gulnare Rock** ( $56^\circ 52' \text{ N.}, 5^\circ 51' \text{ W.}$ ), with 10 feet (3.1 m.) water and steep-to around, lies  $80^\circ$ , nearly  $1\frac{1}{4}$  miles from Eileanan Tri.

The high part of Muck Island open southward of Eileanan Tri, about  $265^\circ$ , leads southward of Gulnare Rock.

**Loch nan Uamh**, on the northern side of the Ardnish Peninsula, is  $1\frac{1}{2}$  miles wide at its entrance. Borrodale Islands, about a dozen islands and a number of rocks, extend more than 1 mile along the northern shore from about 2 miles eastward of Eilean na Ghaill.

**Anchorage**.—This loch, being open to the southwest, does not afford good anchorage for large vessels. Coasters and small craft find sheltered anchorage at the head of the loch and also in places on the northern shore under the Borrodale Islands.

**Borrodale Islands** lie nearly in line northeastward from An Glas Eilean at their western end, and are connected generally by a chain of rocks. An Glas Eilean, Eilean an Sgoir, and Eilean nan Cabar, at the eastern end, are the chief islands of the group.

Astley Rock, with 4 feet (1.2 m.) of water and from 5 to 10 fathoms (9.1 to 18.3 m.) close around, lies 300 yards southwestward of An Glas Eilean, and 200 yards southeastward from it is a rock with  $2\frac{1}{2}$  fathoms (4.6 m.) of water. The Sgor of Eigg open southward of Eilean no Ghaill,  $275^\circ$ , leads southward of these rocks.

Sgeir Dubh, 12 feet (3.7 m.) high, the southeasternmost of the group, is steep-to on its southern side.

Eilean Sgoir, about the middle of the group, lies 400 yards  $47^\circ$  from Sgeir Dubh, and a rock at its summit, 56 feet (17.1 m.) high, shows like a castle.

Eilean nan Cabar, the eastern island, lies 800 yards  $47^\circ$  from Sgeir Dubh and is 50 feet (15.2 m.) high.

**Drumdarroch**, immediately northward of Eilean nan Cabar, is a little harbor suitable for small vessels up to about 150 feet in length. Two rocks, however, narrow the passage northward of the island to less than 200 yards; Rafter's Reef, one of these rocks, which dries 1 foot (0.3 m.), and lies 100 yards northeastward of the northeastern point of Cabar, is marked by a red buoy; the other rock, with 2 feet (0.6 m.) water, lies 65 yards eastward from the point opposite Cabar.

There are two other entrances to Drumdarroch, but local knowledge is necessary to use either.

The best anchorage is in 6 fathoms (11 m.), about 200 yards westward of Rafter's Reef Buoy; no swell ever comes in, and the holding ground is good.

**Borrodale Bay** ( $56^\circ 53' N.$ ,  $5^\circ 48' W.$ ), between Eilean nan Cabar and the next point eastward, may be known by its broadshingly beach. There is a summer anchorage off it in 14 fathoms (25.6 m.), but the ground is not very good. Borrodale House, situated on a commanding height  $\frac{1}{2}$  mile inland from the bay, with some fine trees and a cultivated valley to the eastward, shows well from the southward.

**Sgeir nan Eilid** (Hinds Rock), with 3 feet (0.9 m.) of water, lies 600 yards from the northern shore of the loch, 1,700 yards eastward of Eilean nan Cabar, with Hind Island bearing  $32^\circ$  400 yards. A rocky ledge with from 5 to 9 fathoms (9.1 to 16.5 m.) extends 700 yards southward from the rock.

**Eilean na Gobhlaig** is a heath-covered islet with two tops  $\frac{1}{2}$  mile from the head of the loch. Beasdale Station, on the North British Railway, is situated on the northern side of the loch  $\frac{1}{2}$  mile northward of the islet.

**Tidal currents.**—The tidal currents are weak in Loch nan Uamh; the current runs in during the rising tide and out during the falling tide.

**Directions.**—From the southward, bound for either Loch Moirdart, Loch Ailort, or Loch nan Uamh, after rounding Ardnamurchan, to pass southward of Bo Faskadale and Elizabeth Rock, keep the lighthouse open of Ru Sana until Rudha Aird Druimnich is well open of the land, to clear Bo ha na Crag, when proceed eastward at about  $\frac{1}{2}$  mile off the land until the southwestern extremity of Rum Island opens eastward of the eastern end of Muck Island; then bring White Sand Bay just open of Craig an Dav,  $240^\circ$ , and keep this mark on until the western side of Eigg Island bears  $326^\circ$  (it will then be in range with Bo Faskadale Buoy), when Elizabeth Rock will be passed. If working through this channel, note that Elizabeth Rock lies  $1\frac{1}{3}$  miles from the shore, which may be approached to the distance of 500 yards.

Give Rudha Aird Druimnich a berth of 1 mile, as the bottom off it is very uneven.

**Rudh' Arisaig**, a rugged peninsula with several hills, divides the Sound of Arisaig from Arisaig Harbor. The western coast of the peninsula is broken and rocky with several small indentations.

**Eilean Port na Murrach** ( $56^\circ 53' N.$ ,  $5^\circ 55' W.$ ), 1,600 yards northwestward of Eilean na Ghaill and 100 yards from the shore, is a peaked rocky islet, which shows out well from off the entrance to Arisaig Harbor; eastward of it is Port na Murrach, a little pool with from 6 to 12 feet (1.8 to 3.7 m.) of water, where boats find shelter from northerly winds.

**Meall an Odhar Rocks**, the southern end of which lies  $\frac{1}{2}$  mile northwestward of Eilean na Murrach, are 4 feet (1.2 m.) high, and extend about 600 yards northeastward. The rocks are connected with Rudh' Arisaig by broken rocky ground with very narrow channels across it. The southern rock has a single head, the northern rock 3 heads, above water.

**Arisaig Harbor (Loch nan Crilltean).**—The harbor is faced by a long sand bank, dry at low water, and covered with rocks and islets, of which very few are above high water, but of which Luinga More is at the western and Luinga Beg, 30 feet (9.1 m.) high, is at the northern extremity; the entrance channels are southwestward and northeastward of these islands.

The South Channel into the harbor lies on the northern side of Rudh' Arisaig and southward of the sand bank, but being full of rocks is dangerous to enter, the adjacent islands being low with no objects for marks.

The North Channel between Luinga Beg and Eilean Iadh, being full of rocks and sandbanks, is seldom used, even by those with local knowledge. Bogha Iadh, the outer rock of the North Channel, dries 7 feet (2.1 m.), and lies 500 yards northward of Luinga Beg.

**Buoys.**—A rocky patch, with less than 6 feet (1.8 m.), exists about 400 yards south-southeastward from Sgeir Mhailin. It is marked on the eastern side by a red conical buoy.

Another red conical buoy is moored 750 yards 286°, from Sgeir Mhailin, to mark the edge of a drying rock.

**Luinga More,** on the western part of the bank which faces the entrance to the harbor, and on the northern side of the South Channel, is the largest and highest island, rising to an irregular flat top 48 feet (14.6 m.) high; a sandbank, with many rocks and islets, extends southward and southeastward from it for over ½ mile; the southernmost of these rocks, on the southern edge of the bank, dries 5 feet (1.5 m.), and is marked by a small iron perch.

**South Channel.**—The South Channel lies between the rock and sandbank and the land eastward of Rudh' Arisaig, and its navigable width varies between 100 and 200 yards. Two rocks, with 18 feet and 13 feet (5.5 and 4 m.) of water, lie about 200 yards northward of Rudh' Arisaig; ½ mile farther up, and 100 yards from the shore is Cave Rock (56° 53' N., 5° 53' W.), which uncovers at low water springs. There is also a sunken rock 100 yards westward of Cave Rock the same distance from the shore.

**Depths.**—The channel is tortuous for about 2 miles within Rudh' Arisaig; it then opens out into the basin of Loch nan Crilltean, which has a length of 1¼ miles, a width of ½ mile, and moderate depths of water, generally from 12 to 18 feet (3.7 to 5.5 m.) except at the western end of the basin, where there is a considerable space with from 24 to 60 feet (7.3 to 18.3 m.); there are many central rocks, all marked by beacons (not to be depended on). In the fairway of the channel abreast of Rudh' Arisaig, there are from 33 to 21 feet (10.1 to 6.4 m.), until about 800 yards beyond the anchorage above Cave Rock; then, however, in the narrowest part of the channel for a distance of 1,200 yards the depths are from 7 to 9 feet (2.1 to 2.7 m.), which increase again to 12 and 14 feet (3.7 to 4.3 m.) in the approach to the inner basin.

**Arisaig village.**—The village of Arisaig, situated on the north-eastern shore of the inner basin, has a station of the North British Railway. Its population was 1,374 in 1921.

The only noticeable object within the entrance to the South Channel is a large stone cottage (waiting room) with a slated roof, in a bight where the land takes a sudden bend northward, and behind it is a hollow or valley formed by the southern fall of Torr More.

**Anchorage.**—The best anchorage in the South Channel is 250 yards from the shore just above Cave Rock, in 27 to 30 feet (8.2 to 9.1 m.) water, where there is no swell. It is not safe for a stranger to proceed farther up, as the beacons marking rocks are often displaced.

**Tides and tidal currents.**—It is high water, full and change, in Arisaig Harbor at 5h. 50m.; springs rise  $13\frac{1}{2}$  feet; neaps 10 feet; neaps range 6 feet.

Outside the harbor the tidal current sets northeastward from  $5\frac{1}{2}$  hours before until one-half hour after high water, at a rate of  $\frac{1}{2}$  knot at springs; and southwestward from one-half hour after until  $5\frac{1}{2}$  hours before the next high water at a similar rate.

As long as the sand bank facing the harbor is dry the currents run through the narrow South and North Channels at a great rate, but directly the sand bank covers the currents gradually slacken in the channels, and run, in or out, over all. The current runs in with the rising tide, and out with the falling tide.

One mile off Luinga Beg the current sets northeastward for 7 hours, or from low water to 1 hour after high water.

**Directions.**—Should it be necessary, notwithstanding the danger of so doing, to run for this harbor without local knowledge, in approaching from the northward, especially at high water, do not mistake Luinga More for Rudh' Arisaig; the island extends farther westward than the point, and is comparatively low and flat.

Steer for Rudh' Arisaig on a southeasterly bearing until the waiting room (stone cottage) is nearly in range with the hollow on the southern side of Torr More,  $80^\circ$ ; keep this mark on, and when Rudh' Arisaig bears  $205^\circ$  bring the stone cottage exactly in the middle of the hollow; pass a little more than 100 yards southward of the iron perch marking the 5-foot (1.5 m.) rock, steering about  $80^\circ$  with the stone cottage ahead, and when the small rock 1 foot (0.3 m.) high, 500 yards,  $60^\circ$ , from the iron perch, bears westward of  $340^\circ$ , or the extremity of Rudha Breac bears  $38^\circ$ , give a sheer to the northward and anchor in about 27 feet (8.2 m.).

**The coast** from Eilean Iadh to abreast of the Grey Islands, a distance of 2 miles, is a succession of sandy bays and rocky points, and back of Keppoch, a village of neat detached white cottages, bears eastward from Eilean Iadh.

**Sgeir Beannached Leat** ( $56^\circ 56' N.$ ,  $5^\circ 54' W.$ ), a rock covered at high water and drying 12 feet (3.7 m.) lies 1.2 miles northeastward of Bogha Iadh, at the entrance to the North Channel of Arisaig Harbor; the water is shoal for 100 yards westward of it. The rock should not be approached to a depth less than 25 fathoms (45.7 m.).

No vessel should attempt to pass between the rock and the shore, where there are many islets and rocks, above and below water.

**Grey Islands**, a cluster of islets about 14 feet (4.3 m.) high, lie  $\frac{1}{2}$  mile from the coast and  $1\frac{1}{4}$  miles northeastward of Sgeir Beannached. The islets are partially covered with lichens or grass. Between them and the shore is shoal water, with many sunken rocks, passage through which should not be attempted.

**Bo More**, the outer rock of the Grey Islands, dries about 1 foot (0.3 m.) and lies 400 yards westward of the northern Grey Islet; shoal water extends nearly 200 yards westward of the rock, which should not be approached to a depth less than 25 fathoms (45.7 m.).

**The coast** from the Grey Islands to Morar River is generally rocky, with sandy beaches, and rises to land about 300 feet (91.4 m.) in height 400 yards to  $\frac{1}{2}$  mile inland, whence to Harbor Point, on the western side of Mallaig Harbor entrance, a distance of 2.3 miles; it is rocky, with hills 127 to 382 feet (38.7 to 116.4 m.) in height about  $\frac{1}{4}$  mile inland. The 5-fathom (9.1 m.) curve is from 1,000 to 200 yards off it, and shoal water of  $3\frac{1}{2}$  fathoms (6.4 m.) extends 600 yards northwestward from the middle of Camus Glas na Ceardach,  $1\frac{1}{2}$  miles northward of Morar River.

**Morar River** flows into the sea over a sandy flat about  $1\frac{1}{4}$  miles northeastward of the Grey Islands. The entrance is indicated by the sandy coast and the opening between the hills.

Eilean na h Acairseid, 13 feet (4 m.) high, lies 150 yards offshore  $2\frac{1}{4}$  miles farther northeastward.

**Mallaig Harbor** ( $57^{\circ} 00' N.$ ,  $5^{\circ} 50' W.$ ) and the entrance to Loch Nevis. See next chapter.

**Tidal currents.**—In the main passage from Ardnamurchan Point, past Eigg Island and through Sleat Sound, the currents turn almost simultaneously, running northeastward from  $5\frac{1}{2}$  hours before until one-half hour after high water, and southwestward from one-half hour after high water until  $5\frac{1}{2}$  hours before the next high water. The rate of these currents is about  $1\frac{1}{2}$  knots off Ardnamurchan Point, and less between Eigg and the mainland, but it increases again as Sleat Sound is entered.

Two miles westward of Eilean na h Acairseid the northeast-going current runs from low water until high water, and the current is slack from that time until the northeast-going current again begins; the rate is seldom more than a knot at springs.

**The Small Isles**, a group occupying a considerable space in the large bight between Ardnamurchan and the southwestern coast of the Isle of Skye, consist of Muck, Eigg, Rum, and Canna, with Oigh Sgeir Rocks, all belonging to the county of Inverness. Steamers from Oban call at Eigg, Rum, and Canna regularly, but none of the islands have any telegraphic communication.

**Muck Island** ( $56^{\circ} 50' N.$ ,  $6^{\circ} 15' W.$ ),  $4\frac{1}{2}$  miles northward of Ru Sana, is about 2 miles long east and west, 1 mile broad, and rises near its western end to a height of 450 feet (137.2 m.); it has generally a smooth surface and a rocky coast, but near the western end are cliffs 50 to 60 feet (15.2 to 18.3 m.) high. There are some springs of good water; and in comparison with the neighboring islands, it is very fertile. There is no safe anchorage at this island.

**Eilean nan Each** lies about 800 yards off the northern point of Muck, with which it is connected at low water; its northern coast is rocky.

**Bagh a Gallanaich** is a narrow indentation on the northern side of Muck, where small craft find some shelter; it is protected from the westward by Eilean nan Each. Bohaund, a large low-water rock, blocks a portion of the entrance; inside Bohaund there are about 2 fathoms (3.7 m.) of water for a short distance, with rocks and shoal water further in; with northerly winds, at high water, the bay must be very unsafe.

**A Ghodag**, a rock 6 feet (1.8 m.) high, lies  $\frac{3}{4}$  mile  $323^\circ$  from Muck Moile, the northeastern point of Muck Island; it is steep-to on the southern side, but there are rocks 400 yards to the northward and northeastward.

**Port More**, a creek on the southeastern side of Muck Island, affords some protection, being sheltered by Dubh Sgeir, a double rock a few feet high, and by Bogha Ruadh, a point of rocks dry at low water, extending southward 400 yards, which gives some protection from easterly winds; the narrow channel into the port is between Dubh Sgeir and Bogha Ruadh.

**Bogha an Fionn ard**, 250 yards southward from the southern point of the island,  $\frac{1}{2}$  mile westward of Port More, dries 6 feet (1.8 m.).

**Caution.**—Southward of Port More and Bogha an Fionn ard, and off all the southern and western coasts of Muck Island, the sea breaks very heavily, and there may be unknown rocks farther out than those charted; it is therefore advisable to give a good berth to the island.

**Tidal currents.**—The north-going current on the eastern coast of Muck Island sets about north, or toward the western point of Eigg Island and the east coast of Rum, during the rising, and the south-going current runs in the opposite direction during the falling tide. On the western coast of Muck the currents take a north and south direction, to and from the west coast of Rum Island, turning at the same time as they do on the east coast of Muck. The currents attain a rate of 4 knots at springs near Muck Island.

**Eigg Island** ( $56^\circ 54' N.$ ,  $6^\circ 10' W.$ ),  $2\frac{1}{4}$  miles northeastward of Muck, is nearly  $4\frac{1}{2}$  miles long north and south and 3 miles broad at its southern or widest part; it has several bays and small inlets, but no harbor, and its coast is in most places high and rocky. The inhabitants numbered 181 in 1921, the greater portion located in a village on the northwestern side, but the chief residents are at the southeastern end, where there is a bay and some shelter for small vessels.

The Sgor of Eigg, a peculiar basaltic hill near its southern coast, rises to a height of 1,282 feet (390.7 m.); the upper part is a vertical cliff, and it can only be ascended on the northwestern side. On southwesterly bearings it appears like a ruined tower and on another bearing as an irregular wall crowning the summit of a high hill.

The northern end of the island is a low point, but  $\frac{1}{4}$  mile inland cliffs rise to a height of over 900 feet (274.3 m.), and nearly encircle the island.

**Rudha na Crannaig** is a low point on the southeastern coast of Eigg, about  $\frac{1}{2}$  mile to the northward of Eilean Chasgaidh; on it stands Keil House, a two-storied building, and farther westward on the rising ground are the manse, kirk, and other buildings.

Between Rudha na Crannaig and Eilean Chasgaidh is a bay which has several reefs in it, and the water is generally shoal; it is the only place through which communication is maintained between Eigg and the mainland.

**Garbh Sgeir** is a narrow reef, 400 yards long north and south, northeastward of Eilean Chasgaidh, but separated from it by a 2-fathom (3.7 m.) channel 100 yards wide. The highest part of Garbh Sgeir covers at high water, and westward of it is a space, 200 yards in area, with 10 feet (3.0 m.) water.

**Flod Sgeir** is a double rock northward of Garbh Sgeir with a 2-fathom (3.7 m.) channel between; it covers at three-quarters flood, and there is anchorage inside in 8 feet (2.4 m.). When this rock is awash, boats can get to the inner pier, which is at the head of the bay to the westward.

Ardnamurchan Lighthouse open southeastward of Eilean Chasgaidh,  $203^{\circ}$ , leads southeastward of both Flod Sgeir and Garbh Sgeir.

**Anchorage.**—The best outer anchorage is off Flod Sgeir, but the bank only extends 600 yards outward and then falls suddenly to 30 fathoms (54.9 m.). If Flod Sgeir is above water, steer in with it, bearing  $250^{\circ}$ , and when the eastern extremity of Eigg closes with Rudha na Crannaig, anchor in from 8 to 5 fathoms (14.6 to 9.1 m.), remembering that Rudha na Crannaig dries off 200 yards. Small vessels generally run inside the inner pier during high water and ground or into Poll nam Partan, a muddy bay to the northward.

**Eilean Chasgaidh** ( $56^{\circ} 53' N.$ ,  $6^{\circ} 07' W.$ ), a small island, 93 feet (28.3 m.) high, lies off the southeastern point of Eigg, from which it is separated by a channel 100 yards wide with 2 to 3 fathoms (3.7 to 5.5 m.) water. Rocks dry off 100 yards southward and westward of the island, and a low point extends the same distance from the eastern side.



**Light.**—A flashing white light, 80 feet (24.4 m.) above water, visible 14 miles, is shown from a white beacon on the east point of Eilean Chasgaidh. See Light List.

**South Bay**, on the western side of Eilean Chasgaidh, is  $\frac{1}{2}$  mile deep and about 600 yards wide. Vessels sometimes anchor here in from 8 to 4 fathoms (14.6 to 7.3 m.) of water, but it is open to south-westerly winds; should a vessel be caught by that wind, however, she can slip and run through the channel between Eilean Chasgaidh and Eigg and anchor under Galmisdale Point, on the western side of the narrow part of the channel, where there is a small pier.

When entering South Bay, to clear the rocks off Eilean Chasgaidh, keep Keil House shut in behind Galmisdale Point; and to clear the foul ground off the coast of Eigg, keep Galmisdale Point open of the northern end of Eilean Chasgaidh. Anchor in the middle of the bay in  $7\frac{1}{2}$  fathoms (13.7 m.), with the southwestern point of Eilean Chasgaidh bearing  $126^\circ$ .

The southern coast of Eigg has no shoal more than 200 yards off it.

**Maxwell Bank**,  $1\frac{1}{2}$  miles in extent northeast and southwest, and about 1,200 yards wide within the 10-fathom (18.3 m.) curve, lies about 1 mile southeastward from Eilean Chasgaidh and has from 8 to 10 fathoms (14.6 to 18.3 m.) of water. Depths of from 10 to 15 fathoms (18.3 to 27.4 m.) extend southward and westward from 1,200 yards to 1 mile farther from it.

A large patch with from 14 to 19 fathoms (25.6 to 34.8 m.) lies between Maxwell Bank and Muck Island.

Maxwell Bank should be avoided in heavy weather, as, though sheltered by Muck and Eigg Islands, the sea at such times occasionally breaks on it.

**Dubh Sgeir**, a bare rock 10 feet (3.1 m.) high, is 700 yards offshore, nearly 2 miles westward of Eilean Chasgaidh; there is shoal water for 300 yards to the eastward of it and a depth of 6 fathoms (11 m.) between it and the shore.

**Bogha Curaich** ( $56^\circ 53' N.$ ,  $6^\circ 13' W.$ ), a rock which covers at half tide, lies 400 yards from the southwestern point of Eigg, with other rocks and a boat channel inside; the sea breaks very heavily on the rocks.

The low-water line extends in some places a considerable distance off the west coast of Eigg; and in Laig Bay, on the northwestern coast, the rocks dry off 500 yards.

**Sgeir Breacinnis** extends 600 yards westward from the northern point of Laig Bay. Eilean nan Each (Muck) open of Eigg,  $210^\circ$ , leads northwestward of the reef.

Eilean Thailm, about 200 yards off the northern point of Eigg, is small, and the coast of the islet, and of Eigg for  $\frac{1}{2}$  mile to the south-

eastward, dries at low water for more than 200 yards. The east coast of Eigg is clear, the 5-fathom (9.1 m.) curve being about 400 yards off it in places, and a bank with less than 20 fathoms (36.6 m.) extending to the distance of  $\frac{3}{4}$  mile. The water is sufficiently shallow for anchorage nearly  $\frac{1}{4}$  mile from the shore; it is quite open, but vessels sometimes hold on here during westerly gales.

**Pilots.**—A fisherman will come off if the pilot signal is made within sight of the bay to the northward of Eilean Chasgaidh, but there are no regular pilots.

**Tides and tidal currents.**—It is high water, full and change, at Eigg Island at 6h. 15m.; springs rise 14 feet, neaps 11 feet, neaps range 6 feet.

Close along the eastern coast of Eigg the current sets northward during the rising tide at a rate of 4 knots at springs; and southward during the falling tide. On the southwestern coast, although the currents turn at the same time, they run northwestward and south-eastward, the northwest-going current joining the current running northward from the eastern coast of Muck to the eastern coast of Rum Island. There is probably an eddy, setting southwestward on the western coast of Eigg, while the current is running northward on its eastern side, but no observations respecting the currents on this coast appear to have yet been made.

**Rum Island** is  $7\frac{1}{2}$  miles long north and south, about 6 miles broad, and has one good anchorage. The island is very mountainous, many of the peaks on the southern side being over 2,000 feet (609.6 m.) in height. Orval, 1,862 feet (567.5 m.) high, is the highest mountain within the west coast; while to the southward Ashval rises to a height of 2,545 feet (775.7 m.); and 1 mile to the northeastward of it Askival attains an altitude of 2,652 feet (810.3 m.). This is the highest mountain in the island, and it terminates in a sharp-pointed and nearly inaccessible peak, which, however, in common with other summits of the island, is but seldom seen, the high land being almost constantly enveloped in mist. Rum Island is stocked with sheep and deer, and is well supplied with water, but very little of the soil is under cultivation. The population of the island was 94 in 1911.

Generally the coasts are steep-to. In no place do rocks lie more than  $\frac{1}{4}$  mile offshore. A remarkable geological feature on the northern coast near the western point is a vein of bloodstone, which, however, is not considered worth working. This side of the island is less than 2 miles distant from Sanday, which is connected to Canna.

**Soundings.**—As a general rule the bottom is mud, on and near the east side of Rum Island, sand on the north, and rock on the southern and western sides. On the eastern side of the island the depths are very irregular. Seagull Bank ( $57^{\circ} 01' N.$ ,  $6^{\circ} 11' W.$ ), with 10

fathoms (18.3 m.) of water, rock bottom, lies  $1\frac{3}{4}$  miles  $67^\circ$  from Rudha Port na Caranean, and a rock with the same depth lies  $1\frac{1}{2}$  miles farther eastward.

**Loch Scresort**, an indentation on the east coast of Rum Island, extends westward  $1\frac{1}{4}$  miles, with a general width of  $\frac{1}{2}$  mile, and terminates in a mud flat which dries out 400 yards at low water.

A reef of shelving rock and stones extends 400 yards northward from the southern entrance point of the loch. The sandy Bay of Laig, in Eigg Island, open of Rudha Port na Caranean, the southern point of the loch,  $160^\circ$ , leads eastward of the reef.

The southern shore of the loch is otherwise moderately steep-to. The northern shore is bolder, especially at the entrance, where large rocks above high-water mark the extremity of the low-water line.

Kinloch House, two storied, stands near the shore at the head of the bay, partially protected by trees. Northward of it are the farm offices, and to the southward stands a large red-stone castle with tower and flagstaff. In the southwestern corner of the bay is a good pier, which dries, and a slip which has a depth of about 2 feet (0.6 m.) at its outer end at low water.

**Anchorage.**—A good anchorage for small vessels is in 12 feet (3.7 m.), stiff mud, with a pier bearing  $250^\circ$ , distant 400 yards. For larger vessels a better place is in  $3\frac{1}{2}$  fathoms (6.4 m.), with Kinloch House bearing  $270^\circ$  and distant 800 to 1,000 yards from the pier.

**Directions.**—When entering Loch Scresort keep Laig Bay well open of Rudha Port na Caranean until Kinloch House bears  $270^\circ$  and then steer in and anchor as above directed.

There is an indentation in the land about 1 mile southward of the entrance to Loch Scresort, which might be mistaken for it at night, for, though not so deep, the formation of the land, and especially the northern points of each, are very similar. If from the southward and in doubt, stand on a mile farther to the northward, when the position should be easily ascertained.

**Rudha Shamhnan Insir** ( $57^\circ 03' N.$ ,  $6^\circ 20' W.$ ) is the northern point of Rum Island. Patterson Rock, which uncovers at low water, lies off a little sandy bay nearly 400 yards eastward from the point. Bod an Stoil of Canna Island, touching the foot of the cliffs westward of it, leads northward of Patterson Rock.

**Kilmory Bay**, of small extent and sandy, lies immediately westward of Rudha Shamhnan Insir, but though the water is of moderate depth and the bottom generally sand, it is not recommended as an anchorage. Along the southeastern shore of the bay and toward Rudha Shamhnan Insir are several rocks, one of which, nearly  $\frac{1}{4}$  mile offshore, dries.

The northwestern coast of Rum Island from Kilmory Bay to A' Bhrideanach, its western point, has several shoal patches  $\frac{1}{4}$  mile

off it, but no rocks which dry extend more than 100 yards. On the eastern side of A' Bhrideanach is Camus na h' Atha, a small sandy bay with a rock off each entrance point. Creag nan Stardean, close inland, about 1 mile eastward of A' Bhrideanach, is 1,267 feet (386.2 m.) high.

The southwestern coast of the island is rugged, broken, and cliffy, with several small indentations, but none affording sufficient shelter for boats to land with on-shore winds. No rocks lie more than 400 yards from the coast, except off Papadil, near the southern end, where the ground is foul, and the water breaks some distance (about 600 to 800 yards) off in heavy weather.

The southeastern coast of Rum Island is bold, with the exception of Sgeir a Mhaimord, which covers at spring tides, and is 200 yards from the shore, about 1 mile northeastward of Bibidil Bay.

**Tidal currents.**—About 1 mile off the entrance to Loch Scresort, the currents run northwest and southeast at a rate of about  $1\frac{1}{2}$  knots at springs, the northwest-going current running during the rising and the southeast-going current during the falling tide. On the southwestern side of the island the currents take the direction of the shore and have a rate of 3 knots at springs near the land, turning at about the same time as off Loch Scresort.

**Canna Island**, the northwestern of the Small Isles, is  $4\frac{1}{4}$  miles long east and west, and about 1 mile broad; from a distance to the northwest each end appears to terminate in a bluff, the middle sinking down to a low neck. The eastern end rises to a height of 683 feet (208.2 m.) at Carn a Ghaill. The surface is covered with fine grass; on the tops of the hills is a little heather; there is also a small quantity of peat, which is used for fuel. On the south coast of the island basaltic columns rise to a height of about 20 feet (6.1 m.). The population of the island was 80 in 1911.

**Garrisdale Point** ( $57^{\circ} 03' N.$ ,  $6^{\circ} 36' W.$ ) is the northwestern extremity of the island, and from it two rocky patches extend 700 yards northwestward; the outer rock covers at three-quarters flood and has a boat passage inside it at low water.

The north coast of Canna has rocks and shoal water extending nearly 600 yards off it in places, and there are several uneven patches of from 7 to 10 fathoms (12.8 to 18.3 m.)  $\frac{1}{2}$  mile offshore. There is no good anchorage on this coast.

**Bod an Stoil (Pillar Rock)** is a detached pyramid rock, 82 feet (25 m.) high, situated about  $\frac{3}{4}$  mile northwestward from the north-eastern point of the island.

**Local magnetic disturbance—Compass Hill.**—The cliffs of Canna Island are highly magnetic, and on Compass Hill, 452 feet (137.8 m.) high at its eastern end, a compass becomes useless. The magnetic influence is limited to a few feet and never extends to any considerable distance. Vessels, however, in the vicinity of such

land may pass over magnetic ground in water sufficiently shoal to allow of the compasses being affected until a short distance from it.

**Canna Harbor**, at the eastern end of the island, between Rudha Carinnis on the northeast and Sanday on the southwest, is small, but affords a secure retreat for small vessels in southwesterly gales; the harbor is formed and protected by Sanday, the western end of which is joined to Canna at low water. There are the ruins of a castle at the entrance, and the proprietor's house, with its garden, stands on the northern side of the harbor, the stables being a little to the westward on the beach.

**Rudha Carinnis**, the northeastern point of the harbor, is a vertical black cliff, 102 feet (31.1 m.) high and steep-to; 200 yards further in is a rock which dries off about 60 or 70 yards and is a bad obstruction in the harbor, but for which there is no clearing mark. Immediately northwestward of this rock is the anchorage, 200 yards in area, with 2 fathoms (3.7 m.) water, mud bottom.

**Sanday**,  $1\frac{3}{4}$  miles long east and west, and from 200 to 1,000 yards broad, rises to a height of 126 feet (38.4 m.) at its eastern end, which terminates in a cliff and is steep-to, but the southern side has rocks drying 400 yards off it. There are some detached rocks of considerable height off the eastern end; and of these the Dun na Feulan are the most remarkable; two of them are but a short distance from the cliff, and although their height is not more than 100 feet (30.5 m.), they form striking combinations with the coast. The smallest resembles a steeple; the other appears like a large tower.

**Light**.—A flashing white light, 105 feet (32 m.) above water, visible 15 miles, is shown from a white beacon on the eastern extremity of Sanday.

**The Reef** (Sgeir a Phuirt) ( $57^{\circ} 03' N.$ ,  $6^{\circ} 29' W.$ ) is a rock about 300 yards in extent northwest and southeast, which covers at high water and lies nearly in the middle of the entrance to Canna Harbor and 400 yards off a bay on the northern side of Sanday; it gives considerable protection from easterly winds; there is a 3-fathom (5.5 m.) passage between the reef and Sanday, but the proper entrance is northward of the reef. A fringe of low-water rocks extends about 100 yards off Sanday as far as Ru na Fennagh, which terminates in a small islet, and thence a muddy flat, dry at low water, extends across the harbor and up to its head.

**Directions**.—When entering Canna Harbor keep Ru na Fennagh in range with Rudha Carinnis, about  $267^{\circ}$ , and giving the latter a close berth, continue on the same course until the proprietor's house bears  $340^{\circ}$ , then sheer in 200 yards to the northward and anchor in 2 fathoms (3.7 m.) water.

In working, do not stand close to the southern shore within the reef, as a rock awash at low water lies nearly 200 yards from that shore. Castle Coroghon in range with Rudha Carinnis leads westward of it. A square-rigged vessel should anchor off Rudha Carinnis in 8 fathoms (14.6 m.) and not attempt to work farther up the harbor.

**The south coast.**—On the southern side of Canna Island is a broad bay divided by a reef of small islets and rocks. Boat Harbor is situated in the eastern corner of the eastern bay, but it is encumbered with rocks. About the middle of the entrance is Black Rock, 6 feet (1.8 m.) high; this rock in range with Compass Hill leads southeastward of the outer rocks; there is a depth of 2 fathoms (3.7 m.) inside Black Rock, sand bottom, and in the southeastern corner boats can be hauled up on the sandy beach. Tarbert, the western bay, affords anchorage in 9 fathoms (16.5 m.) during northerly winds, but this anchorage is not recommended.

**An Steidh,** a small and flat-topped islet, lies 400 yards from the southern point of the western end of Canna. Outside it are 2 small rocks a few feet high, with a passage for boats inside. About 500 yards westward from An Steidh is a large patch of rocks and foul ground; the rocks cover at half tide, and there is a 3-fathom (5.5 m.) channel inside them.

Several low-water rocks lie 400 yards offshore between An Steidh and Garrisdale Point.

**Banks,** on which are several rocks, small islets, and very uneven bottom, extend nearly 10 miles southwestward from the southwestern end of Canna Island.

**Jemima and Belle Rocks.**—A cluster of sunken rocks extends nearly  $\frac{1}{2}$  mile east and west to the southwestward of An Steidh. Jemima Rock, with 5 feet (1.5 m.) of water, at the eastern end of the cluster, lies with An Steidh bearing  $32^\circ$ , distant 1,800 yards; Belle Rock, with 10 feet (3.1 m.) of water, is near the western end of the cluster; and between these are other rocks, with uneven bottom. Ru na Clach, on the eastern side of the entrance to Loch Bracadale, Isle of Skye, well open northwestward of Canna,  $19^\circ$ , leads northwestward of the rocks.

**Umaolo** ( $57^\circ 01' N.$ ,  $6^\circ 37' W.$ ), a small bare rock 17 feet (5.2 m.) high, lies  $205^\circ$ , distant 1.8 miles from An Steidh; shoal water extends about 100 yards northward from the rock, but otherwise it is steep-to.

**Light buoy.**—A red conical buoy, exhibiting a flashing white light, is moored 350 yards southwestward of Umaolo.

**Tides and tidal currents.**—It is high water, full and change, at Canna at 6h. 19m.; springs rise 14 feet, neaps  $9\frac{1}{2}$  feet.

Between Canna Island and Umaolo the current sets north-north-westward during the rising tide at a rate of about  $2\frac{1}{2}$  knots at springs and south-southeastward during the falling tide at a similar rate, but near Jemima and Belle Rocks the current has a rate of about 4 knots and sets strongly over the rocks, causing whirls and eddies near them which are dangerous to small craft in light winds. The current running northwestward along the southwest coast of Rum Island appears to split on the south coast of Canna, part running eastward toward the channel between Rum and Canna and part westward between Umaolo and Canna.

**Oigh Sgeir**, a group of islets about  $\frac{1}{2}$  mile in extent, lies  $43\frac{3}{4}$  miles  $215^\circ$  from An Steidh, and the highest part, on the eastern side, is 27 feet (8.2 m.) high; the southwestern islets are low.

The eastern coast is steep-to. There is no anchorage near the islets. There is no water on the islets, but the surface is covered in summer with coarse grass and the sea pink. A landing can generally be effected in moderate weather in some of the creeks on their northwestern side.

**Light.**—A group flashing white light, 136 feet (41.5 m.) above water, visible 17 miles, is shown from a white tower with black top, 128 feet (39 m.) high, on a rock near the southern extremity of Oigh Sgeir.

The proper route between the Little Minch and the Sound of Mull passes through the clear and deep channel eastward of Oigh Sgeir and between those islets and Umaolo.

**Tidal currents.**—No tidal observations appear to have been made near Oigh Sgeir, but it is probable that the current here sets north-northwest during the rising and south-southeast during the falling tide.

**Mills Rocks** are the southwestern of the rocks off Canna, and the nearest to the Hebrides Islands, the distance across the Sea of the Hebrides being about 18 miles. The rocks lie  $2\frac{1}{4}$  miles south-westward from Oigh Sgeir Lighthouse and are two heads 400 yards apart, with 6 feet (1.8 m.) of water, moderately steep-to around; there is a patch of 7 fathoms (12.8 m.) about 800 yards to the westward. The northern end of Eigg Island, open southward of Rum Island  $86^\circ$ , leads about  $1\frac{1}{2}$  miles southward of them.

In thick weather do not approach Mills Rocks to a depth less than 30 fathoms (54.9 m.). There are from 20 to 29 fathoms (36.6 to 53 m.)  $1\frac{1}{4}$  miles and over 60 fathoms (109.7 m.) about  $2\frac{1}{2}$  miles southward from the rocks.

The bottom is so uneven on the bank for about 3 miles south-westward of Mills Rocks that, although the least depth known is 14 fathoms (25.6 m.) there are heavy breakers over it during gales.

## CHAPTER VI

**ISLE OF SKYE—SOUTHWEST COAST, LOCH BRITTLE TO POINT OF SLEAT; EAST COAST, SLEAT SOUND, WITH KYLE RHEA—LOCHS NEVIS, HOURN, ALSH, DUICH, AND LONG—KYLE AKIN—LOCHS CARRON AND KISHORN—SCALPAY, RAASAY, AND SOUTH RONA, WITH INNER AND RAASAY SOUNDS—LOCHS TORRIDON AND GAIRLOCH—THE COAST TO RUDH' RE**

**Isle of Skye** is included in the county of Inverness, from the mainland of which it is separated by Sleat Sound, Kyle Rhea, Loch Alsh, Kyle Akin, and Inner and Raasay Sounds. The island is about 42 miles long north and south, and about 20 miles wide at its northern and southern ends, but not more than 13 miles wide in the middle, and in places the heads of lochs on the opposite sides of the island approach to distances of from  $1\frac{1}{4}$  to  $3\frac{1}{2}$  miles from each other.

Skye is mountainous, with moorland; the rocks are mainly volcanic, of Tertiary age. The principal mountains are the Cuillin Hills, which stretch irregularly northeastward from between Lochs Brittle and Scavaig.

Garsbheinn (the hill of the Roaring Blast), the southern peak of the southwestern ridge of these hills, is situated about 1 mile westward of Loch Scavaig; its summit, 2,928 feet (892.4 m.) high, is very narrow.

With northerly winds, which come on suddenly, gusts descend the steep sides of Garsbheinn in most violent squalls, driving a cloud of foam before them, and almost before there is time for a gust to drive a vessel to the extent of her cable it has passed, and is succeeded for a few moments by a calm.

Sgurr na Banachdich, 3,161 feet (963.4 m.) high, with its smooth shoulder, Sgurr nan Gobhar, are the northern peaks of the southwestern ridge, and lie from about 1 to 2 miles northeastward of the head of Loch Brittle. Sgurr Dearg ( $57^{\circ} 13' \text{ N.}$ ,  $6^{\circ} 14' \text{ W.}$ ), about  $\frac{1}{2}$  mile to the southward of Sgurr na Banachdich, is 3,228 feet (983.9 m.) high, and the highest of the range.

This rugged region is subject to sudden and violent storms.

The coasts abound in fish, principally herring, salmon, cod, and ling; oysters are found in several places. The cod and ling fishery



is chiefly carried on in Lochs Dunvegan and Snizort. There are no rivers of any size. Deer are not numerous, but West Highland cattle are largely reared, and sheep farming on a large scale prevails. The climate is mild and healthy, though wet, and in consequence of the moisture agriculture is neglected. The population of the island was 11,608 in 1921.

Portree, on the eastern coast, is the only town in Skye, and it possesses an excellent anchorage. Steam communication is kept up through Oban with Glasgow and with Stornoway. Other villages, also calling places for the steamers, are Kyleakin, Broadford, and Dunvegan.

The chief exports are wool, sheep, small cattle, and herrings; the latter have been taken in large quantities in the different lochs.

The Quiraing, a crater-shaped hollow in the northern side of Sgurr More, a flattish-topped mountain, 1,774 feet (540.7 m.) high, 4 miles from the northern end of Skye; the Spar Cave; and Loch Coruisk afford fine scenery.

**The southwest coast** of Skye, from Loch Brittle northward to Neist Point, and the northwest coast thence to Rudh' an Aiseig, is described in British Islands Pilot, Vol. V.

**Loch Brittle to Point of Sleat.**—**Crochdan** ( $57^{\circ} 11' N.$ ,  $6^{\circ} 20' W.$ ), the bluff on the northwestern side of the entrance to Loch Brittle, has a rocky sea front rising vertically to the height of 500 feet (152.4 m.) and is intersected from top to bottom by a large chasm.

**Loch Brittle**, the entrance to which, between Crochdan and Rudh' an Dunain, is 1 mile wide, extends northeastward  $2\frac{1}{4}$  miles, and has depths of 17 fathoms (31.6 m.), gradually shoaling to 5 fathoms (9.1 m.), and then rapidly to the low-water line, which, at the head of the loch, extends  $\frac{1}{4}$  mile offshore, and is generally sandy. A 5-fathom (9.1 m.) bank lies in the entrance 600 yards northward of Rudh' an Dunain.

The shores of the loch are generally sloping, except at Crochdan.

The loch affords no shelter from southerly or southwesterly winds, which cause much swell; and even with westerly winds anchorage in it is not safe.

Rudh' an Dunain House is  $\frac{1}{2}$  mile within the head of the loch. It is large, but not conspicuous from seaward. A considerable burn flows past it into the northeastern corner of the bay, where there is a small pier at which small craft discharge goods for the farm.

**Rudh' an Dunain** is the point at the end of the promontory on the southern side of Loch Brittle; on northerly or easterly bearings the promontory appears comparatively low and flat, with a double-topped hill near its extremity. Inland the ground is flat and

lower, but farther in it again rises to the Cuillin Range. A sunken rock lies about 200 yards westward of the point.

There is a moderately good landing place in the first bay north-eastward of Rudh' an Dunain, in a deep indentation in the low-water rocks.

The coast from Rudh' an Dunain trends eastward 5 miles to Rudha Gheoda Bhuidhe, the western entrance point of Loch Scavaig.

**Sgeir More**, a bare flat islet 10 feet (3.1 m.) high, is joined to the shore at low water, on the southern side and 800 yards eastward of Rudh' an Dunain. About 200 yards westward of the islet is a large low-water rock, which covers at half flood, and the same distance eastward of it are two rocks, awash at low water. A little eastward of these, on a nearly detached rock, are the remains of an old fort.

**Soay** ( $57^{\circ} 09' N.$ ,  $6^{\circ} 13' W.$ ), off the coast between Rudh' an Dunain and Rudha Gheoda Bhuidhe, is  $2\frac{3}{4}$  miles long northeast and southwest, and  $1\frac{1}{4}$  to  $1\frac{1}{2}$  miles broad, but it is nearly divided in the middle, the two parts being connected by a low isthmus, with Soay Harbor, a narrow creek, on its northern side, and Camus nan Gall on its southern side. The eastern part of the island is 449 feet (136.9 m.) high and the western part 301 feet (91.7 m.).

From about 1 mile southward of Soay the low flat point of Rudh' an Dunain, the high cliffs on the northwestern side of Loch Brittle, the pinnacle rock close to the coast 1 mile southeastward of Dubh Sgeir, and Stac a Mhadaidh, a martello-tower like rock about 70 to 80 feet (21.3 to 24.4 m.) high, still farther to the northward, are conspicuous.

**Camus nan Gall** extends northwestward about  $\frac{1}{2}$  mile, and is about  $\frac{1}{2}$  mile wide. Its shores are not steep-to, though the central depths are too great for convenient anchorage. It is open to the southeast and a heavy sea rolls in in southerly or southeasterly gales.

The western shore of the bay is fringed with low-water rocks to the distance of 100 yards, but off the western point detached rocks dry off for more than 200 yards.

**Craiglea**, a cliff 36 feet (11 m.) high, is situated about the middle of the eastern side of the bay; and at the head of the bay are two gravel beaches, between which is a low cliffy head with a stone wall along its top. Near this a burn, from which water may be obtained, flows into the bay.

About 400 yards eastward of the entrance to the bay are two small black rocks, the outer of which is 6 feet (1.8 m.) high, and from it a ledge dries off about 130 yards. At 300 yards west-northwestward of the black rocks is a rocky point, off which a reef extends 300 yards southward. The stone wall between the two beaches touching Craiglea Cliff  $313^{\circ}$  leads westward of these reefs. Above Craiglea are

two rocks, dry at low water; one is 100 yards from the eastern shore, the other 200 yards from the northeastern corner of the bay, and it is in the way of small vessels seeking an inshore berth.

**Anchorage.**—The best anchorage is in about 15 fathoms (27.4 m.), with the eastern cliff of Eigg Island in range with the western point of the bay.

**Directions.**—From the westward, to anchor in Camus nan Gall, keep Canna Island well open southward of Soay until Sgurr na Stri is open southeastward of Soay; when the bay is well open, steer for the anchorage. When beating into the bay, to avoid the rocks off the eastern shore, especially just at the entrance, tack before the wall between the beaches is in range with Craiglea.

**Pilots** for Camus nan Gall may be obtained at any of the ports on the southwestern coast of Skye.

**Tides.**—It is high water, full and change, at Camus nan Gall at 5h. 42m.; springs rise 12 feet, neaps 9 feet.

**Gamhna Islets**, about 700 yards off the southern part of the western side of Soay, are a cluster of rocks generally awash at high water, but the highest is 6 feet (1.8 m.) high.

**Cock and Hen Rocks** (Coileach and Chearc), lying 400 yards southward of the southern Gamhna Rock, with deep water between them and the shore, are awash at low water. Ben Meabost, 1,122 feet (342 m.) high, and the highest hill in the Straithaird Peninsula, just open south-southeastward of Soay, 63°, leads south-southeastward of the rocks; Ben Meabost has a flat top with a very small peak to the northward.

About 800 yards eastward of these rocks and 300 yards from Soay is a rock with 2 fathoms (3.7 m.) water, and extending 450 yards from the island about  $\frac{1}{4}$  mile northward from Gamhna is a large patch of rock, the highest part of which, at the southwestern end, covers only at spring tides; there is a boat channel inside it at low water. The west coast of Soay to the northward has rocks dry at low water extending 400 yards off it.

The north coast of Soay is fringed with rocks, dry at low water, to the distance of 100 yards, which are generally steep-to.

**Soay Harbor**, on the north coast of Soay,  $1\frac{1}{4}$  miles eastward of its northwestern point, is a narrow creek nearly  $\frac{1}{2}$  mile long; a shingle bar, which dries 2 feet (0.6 m.) at springs, crosses the entrance, but there are 2 fathoms (3.7 m.) inside. A vessel could anchor temporarily in southerly winds off the entrance, but rocks dry off nearly 200 yards from the eastern point.

**Black Harbor** is a small bight 1 mile eastward of Soay Harbor. To get out of the tidal current, it is necessary to anchor so close in-shore that, should the wind come from the northward, there is

scarcely room to swing clear of the cliffs; the harbor is open to the eastward, but the holding ground is good.

The southeastern coast of the island between Black Harbor and Camus nan Gall has many detached rocks, extending 300 yards off in places.

**Soay Sound**, the channel between Soay and Skye, is about 1,200 yards wide in its narrowest part, with deep water. On the northern shore opposite Soay Harbor rocks, dry at low water, extend nearly 300 yards off the mouth of Allt nan Leac, a burn.

**Loch Scavaig** is about  $\frac{3}{4}$  mile wide at its entrance between Rudha Gheoda Bhuidhe and Ru Buidha, and it extends 1 mile to the northward; the loch has a moderate depth of water, but is studded with rocks which dry, and the space available for anchorage is very limited; but as it affords access to Loch Coruisk, the southern end of which is only about 200 yards within the head of Loch Scavaig, it is often visited by yachts.

A steamer from Oban calls here once a week in summer.

The western shore of the loch is the eastern side of Garsbheinn; the rocky, precipitous sides of the mountain rise from the shore in black, bold, and irregular cliffs, and so steep in places that a stone dropped from the summit falls into the sea.

**Eilean Reamhar**, a rocky island projecting 200 yards from the western shore of the loch, is moderately steep-to, and northward of it is an area of 150 yards in extent which receives some protection. Sgeir Doighich, 300 yards northward of Eilean Reamhar, is a small islet lying off the western shore, with a boat channel inside it. One-third mile farther up is the head of the loch, where Sgurr Du, a barren rocky hill, rises precipitously to a height of over 500 feet (152.4 m.).

**Eilean Glas**, on the eastern side and near the head of the loch, is sufficiently large to form a safe anchorage inside it 150 yards in area, with 2 fathoms (3.7 m.) water, but there is a small rock in the entrance, and it should not be entered without local knowledge.

The superfluous water from Loch Coruisk flows over a smooth rock with a fall of a few feet into a little bight on the eastern side of Eilean Glas.

Perhaps the best anchorage in the loch is midway between Eilean Glas and Sgeir Doighich in 3 fathoms (5.5 m.) with the outer part of the Sgeir in range with the inner side of Eilean Reamhar. It is, however, a rough anchorage; with southerly or southeasterly winds, a short but heavy swell rolls in, and with northerly winds, the gusts and flurries coming down the mountain sides are most trying to the best ground tackle. Even with westerly gales, squalls from all sides come roaring down, driving the vessel round her anchor; in fact,

with a strong breeze between west, through north, to east-northeast, Loch Scavaig is not approachable by a sailing vessel. The advantage of being inside Eilean Glas is that the surrounding sides of rock defend the cove, and the squalls pass hissing and roaring overhead.

The middle and the eastern side of Loch Scavaig are encumbered with rocks.

**Bo Maigh**, the outer rock, lying in the middle of the loch, with Eilean Reamhar bearing  $300^{\circ}$ , distant 600 yards, is awash at low water.

**Broad Rocks** are three in number; the western rock, awash at low water, is rather more than 200 yards eastward from Eilean Reamhar. Between Broad Rocks and Bo Maigh is a rock awash at low water, and about 170 yards southward from the southern end of Eilean Glas is a rock, dry at low water.

**Directions.**—From the westward, vessels can pass through Soay Sound, where there is no danger except from squalls, provided the northern shore, especially off Allt nan Leac, be not closely approached. Round Rudha Gheoda Bhuidhe, the point forming the foot of Garsbheinn, at the distance of about 600 yards; pass Eilean Reamhar at 100 yards, keeping Sgurr Du in range with the western end of Eilean Glas, and anchor in 3 fathoms (5.5 m.) when the outer part of Sgeir Doighich is in range with the inner part of Eilean Reamhar. To proceed to the head of the loch, keep the same mark on, and rounding Eilean Glas at the distance of 50 yards, anchor in the middle of the basin in from  $2\frac{1}{2}$  to 2 fathoms (4.6 to 3.7 m.), mud, with Eilean Glas touching Eilean Reamhar, and run a warp to the island.

From the southward the Cuillin Range, with the lower but sharp cone of Sgurr na Stri in the gap between it and Blath Bheinn, indicates the position of Loch Scavaig. Keep within  $\frac{3}{4}$  mile of Strait-haird or of Soay, according as the wind is easterly or westerly, to avoid Bogha Carrach, and, when Soay Sound is fairly open, bring Sgurr Du in range with the western end of Eilean Glas and proceed as above directed.

**Tidal currents.**—The north-going currents passing on each side of Eigg Island take a direction toward Soay and Loch Scavaig, and split on Soay, one part turning northwestward outside that island and passing across the mouth of Loch Brittle, while the other part fills Loch Scavaig and also takes a westerly direction through Soay Sound, at the western end of which it meets the northwest-going current outside Soay almost at a right angle, causing a nasty, confused sea, especially with southerly or southwesterly winds.

The current runs into Loch Scavaig and westward through Soay Sound during the rising tide, the rate being considerable through Soay Sound and off Rudh' an Dunain.

The current runs to the southward out of Loch Scavaig during the falling tide, but it continues running westward through Soay Sound, off the western end of which it joins the current now setting southeastward along the coast of Skye, and the combined currents turn toward the channel between Rum and Eigg Islands.

**Sgurr na Stri** ( $57^{\circ} 12' N.$ ,  $6^{\circ} 08' W.$ ), the southern peak of a mountainous range which separates Loch Scavaig from Camus Fhionnairidh, is a rugged, bare, dark, rocky, and almost inaccessible cone, 1,617 feet (492.8 m.) high. The western face is mostly a cliff; the eastern is not so steep; a gully or split in the rock extends from summit to base of the southeastern part of the mountain, dividing the summit into two peaks, and the split is open on northwesterly bearings.

**Camus Fhionnairidh** is an open bay on the southeastern side of Sgurr na Stri, and from it a valley dividing the Cuillin Range from the Aird Hills crosses the island to the head of Loch Sligachan. There are depths of 5 fathoms (9.1 m.) across the entrance to the bay, whence the depth decreases to the head. A reef of rocks, which uncovers at low water, extends 300 yards from the southern point on the eastern side of the bay. On the northeastern shore of the bay is a solitary farmhouse with a few acres of arable land about it. Two small rivers flow into the head of the bay, off which a deposit of sand and gravel extends 300 yards.

**Anchorage** may be found anywhere off the bay, but it is too open to be recommended, even with the wind off the land; it generally blows hard, and a sudden shift of wind raises a sea against which it is difficult to contend.

**Straithaird Point** is a promontory formed by a spur extending southward  $5\frac{3}{4}$  miles from Blath Bheinn, a rugged mountain, 3,036 feet (925.3 m.) high, situated 2 miles north-northeastward of the head of Camus Fhionnairidh. The promontory is about  $1\frac{1}{2}$  miles in width, and rises in several places to heights of from 400 to 1,200 feet (121.9 to 365.8 m.).

The coast from the southern point on the eastern side of Camus Fhionnairidh trends southward  $2\frac{1}{2}$  miles to Suidhe nan Eun, which terminates in an overhanging cliff 100 feet (30.5 m.) high.

**Bogha Carrach**, nearly midway between the eastern end of Soay and the land of Straithaird, about 1 mile from the latter, with Fhionnairidh farm directly under the summit of Blath Bheinn,  $25^{\circ}$ , has 2 fathoms (3.7 m.) water. It lies on a rocky bank  $\frac{1}{2}$  mile long, with general depths of from 5 to 8 fathoms (9.1 to 14.6 m.). Rudha

na h Easgainne in range with Suidhe nan Eun, 123°, leads southward of the bank, and  $\frac{1}{2}$  mile south-southwestward of the rock.

The coast from Suidhe nan Eun trends southeastward 1 mile to Rudha na h Easgainne, the southern extremity of the promontory; it is not bold, rocks drying off, including those around Eilean na h Airdhe, for as much as 400 yards east-southeastward and 900 yards west-southwestward from Rudha na h Easgainne.

**Eilean na h Airdhe**, an islet about 300 yards long, northwest and southeast, and nearly connected with Straithaird at low water, is about 70 feet (21.3 m.) high; rocks extend southward 400 yards from it, and it is otherwise very shoal all around. **Sgurr na Stri** in range with Suidhe nan Eun leads westward of Eilean na h Airdhe and the foul ground around it.

The coast of Straithaird from Rudha na h Easgainne trends northeastward 3 miles to Kilmarie Bay.

**Bogha Ailean**, with 1 fathom (1.8 m.) water, lies 400 yards offshore 1,600 yards southward of Kilmarie Bay; there are 3 fathoms (5.5 m.) water inside it. The southeastern extremity of Rum Island well open of the land of Straithaird, 212°, leads southeastward of it.

**Kilmarie Bay** is on the western side of the entrance to Loch Slapin; the sand dries off about 400 yards from its head, and the water is shoal for nearly the same distance farther. In the southwestern part of the bay there is a pier and a few cottages.

**Loch Slapin** is  $1\frac{3}{4}$  miles wide between Rudha Suisnish, its eastern entrance point, and the opposite shore, and extends northward  $3\frac{3}{4}$  miles, narrowing rapidly and decreasing in depth from 18 and 20 fathoms (32.9 to 36.6 m.) in the entrance to 6 and 4 fathoms (11 and 7.3 m.) before the narrowest part is reached, where the loch contracts to  $\frac{1}{4}$  mile in width, and then again opens out into a wide anchorage, which is seldom used.

A rock, with  $11\frac{1}{4}$  fathoms (2.3 m.) least water, is reported to lie 600 yards off the western shore 1.2 miles within the western entrance point.

**Rudha Suisnish** is the termination of Ben Dearg, a steep hill 630 feet (192 m.) high, and is fringed with low-water rocks to a distance of nearly 400 yards.

**Loch Eishort** is 2 miles wide in its entrance between Rudha Suisnish and its southern entrance point, which is also the northeastern point of Ob Ganscavaig; it extends eastward  $5\frac{1}{2}$  miles, narrowing to 600 yards at  $2\frac{1}{2}$  miles from its entrance; it is so intricate in its navigation that, although there is good anchorage and shelter in the upper part of the loch in from 4 to 6 fathoms (7.3 to 11 m.), no stranger should attempt to enter it under any circumstances.

The west coast of the Sleat Peninsula southward of Loch Eishort is indented by several small bays, but as it is open to the pre-

vailing southwesterly to northwesterly winds there are no safe anchorages. Rocks, dry at low water, extend very generally about 300 yards offshore.

**Ob Ganscavaig** is a small bay. Dun Scaich, on its northeastern point, is a fine old ruin with a drawbridge.

**Tarscavaig Bay**,  $1\frac{1}{2}$  miles southwestward of Ob Ganscavaig, is about 1,200 yards wide at its entrance, and it extends eastward about  $\frac{1}{2}$  mile. Many rocks lie in and off the bay, which has depths of from 4 to 2 fathoms (7.3 to 3.7 m.) between and among them. Sgeir More is the outer of some rocks which extend  $\frac{1}{2}$  mile off the southern side of the bay, and cover at the last quarter flood. There is a pier on the northern side of the bay.

The coast from Tarscavaig Bay trends generally southward  $5\frac{1}{4}$  miles to the Point of Sleat.

**Tidal currents.**—The north-going current from the eastern side of Eigg Island sets toward the western side of the Sleat Peninsula and into Lochs Slapin and Eishort during the rising tide, and the south-going current sets out of these lochs during the falling tide. The rate of these currents does not appear to be great.

**Point of Sleat** ( $57^{\circ} 01' N.$ ,  $6^{\circ} 01' W.$ ), the southwestern extremity of the Isle of Skye, is a low, rugged, and uncultivated peninsula, with much rock protruding on the western side, the land rising gradually in height to the northeastward. On the western side of the point are several outlying rocks, of which Black Rock, the outer one, is 1 foot (0.3 m.) high, and lies 400 yards westward from the point; the eastern side of the point is also foul for more than 200 yards.

**Sleat Sound** is the strait which separates the southeastern coast of Skye from the mainland of Inverness Shire. Sleat is a peninsula with hills, which have no distinctive character, from 240 to 972 feet (73.2 to 296.3 m.) in height, extending southwestward about 12 miles from between the heads of Lochs Eishort and na Dal to the Point of Sleat.

**Camus Daraich**, immediately eastward of the Point of Sleat, might be useful as an anchorage in northerly winds only. A stranger should anchor off the middle of the bay in 8 fathoms (14.6 m.) with Ard Thurinish open, there being several sunken rocks farther in.

**Ard Thurinish**, nearly 2 miles eastward of the Point of Sleat, has on its western side Port na Long, a little open bay, and, on its eastern side, Port Cul, a still smaller bay; it is a bold, cliffy, indented headland with deep water on its southern side, but its western side should not be approached nearer than 400 yards.

Tormore House is situated on the headland of the same name  $1\frac{1}{2}$  miles northeastward of Ard Thurinish.



**Rudh Dubh** is nearly 1 mile north-northeastward of Tormore; a rocky ledge extends 300 yards southward of it, and Bogha Charslice, a rock that dries 3 feet (0.9 m.) lies 400 yards offshore and 600 yards southwestward of the point.

At  $\frac{1}{4}$  mile north-northeastward of Rudh Dubh, and separated from it by a foul and rocky bight, is Ru Ardavasár.

Two rocky islets, Scorach and Eilean Maol, 30 and 9 feet (9.1 m. and 2.7 m.) high, respectively, lie off Rudh Dubh and Ru Ardavasár; 200 yards outside them the water is deep, but rocky ledges dry off southwestward from each islet. The land in this vicinity should not be approached within 600 yards; at night, Isle Ornsay Light in sight, open of the land, leads well outside the rocks.

**Armadale Bay** is immediately northward of Ru Ardavasár, which partly shelters the bay from southerly winds. There is anchorage in about 10 fathoms (18.3 m.) but it can only be used with great caution, for at times a considerable swell sets in.

**Pier.**—A fixed white light, 19 feet (5.8 m.) above water, visible 5 miles, is exhibited on the new pier.

Armadale Castle, on the shore of the bay nearly  $\frac{1}{2}$  mile northward of Ru Ardavasár, is a fine castellated building, standing on raised ground surrounded by woods.

**Kilbeg Point**,  $\frac{1}{2}$  miles north-northeastward of Ru Ardavasár, is a projecting point 89 feet (27.1 m.) high; a reef of rocks extends south-southwestward 350 yards from the steepest part of the point; the outer part of the reef, being 2 feet (0.6 m.) high, is generally visible, but has to be guarded against during very high springs.

**Knock Bay**,  $\frac{1}{2}$  miles north-northeastward of Kilbeg Point, has from 10 to 12 fathoms (18.3 to 21.9 m.) of water within 400 yards of the shore, with bad holding ground, and is open to southerly and southwesterly winds. The water is very shoal in the northwestern head of the bay, and drops suddenly from a few feet to about 10 fathoms (18.3 m.).

**Tartar Rock** ( $57^{\circ} 07' N.$ ,  $5^{\circ} 49' W.$ ), with 5 feet (1.5 m.) water, lies 1,600 yards northeastward from Bird Point, the eastern point of Knock Bay, and 300 yards offshore. Isle Ornsay Lighthouse, bearing  $22^{\circ}$ , well open of Pig Point, leads  $\frac{1}{4}$  mile southeastward of the rock. The light is in sight from the rock.

**Camus Croise**,  $\frac{1}{2}$  mile south-southwestward of Isle Ornsay Lighthouse, is a small and shallow bay; on the northern side of the entrance the bottom is stiff clay, and small vessels sometimes anchor here, but it is not safe with southwesterly winds.

**Isle Ornsay**, about  $\frac{1}{2}$  mile north-northeastward of Camus Croise, is about 800 yards in extent, 138 feet (42.1 m.) high, and covered with grass. A rugged reef, chiefly rocks which dry, extends 200

yards north-northeastward from the island; the outer rock is a small islet, 5 feet (1.5 m.) high, with a few tufts of grass on it. About 100 yards north-northeastward of this islet there is a depth of 1 fathom (1.8 m.) immediately outside which is deeper water. On the east coast of the island rocks dry off 150 yards.

**Lights.**—A fixed white light, 58 feet (17.7 m.) above water, visible 12 miles, is shown from a white tower, 63 feet (19.2 m.) high, on the outer part of a small rocky islet close off the southern end of Isle Ornsay, to which it is connected at half tide.

A flashing white light, 23 feet (42.1 m.) above water, visible 9 miles, is shown from a black stone beacon surmounted by a tank, situated on the outer extremity of the reef extending from the north-eastern point of Isle Ornsay.

**Isle Ornsay Harbor**, on the northern side of Isle Ornsay, is a place of refuge for vessels in southwesterly gales, or waiting a fair wind for Kyle Rhea. It is easy of access and departure, and is sheltered from all winds. Easterly winds send in a little sea, and westerly winds are rather squally.

Isle Ornsay Village is at the head of the harbor. A few ships' stores, and water in small quantity, might be obtained; 50 to 80 tons of coal are usually in stock. There is a pier near the houses where vessels of about 8 feet (2.4 m.) draft can lie alongside at high water.

The mail steamers between Mallaig and Portree call daily, except Sundays.

**Anchorage.**—A large vessel should anchor in about 7 fathoms (12.8 m.), clay bottom, about 700 yards offshore, with the northeast light beacon bearing  $155^{\circ}$ , distant 800 yards. Small vessels can go closer in.

**Tides.**—It is high water, full and change, at Isle Ornsay at 5h. 50m.; springs rise  $14\frac{3}{4}$  feet, neaps  $10\frac{1}{2}$  feet; neaps range  $5\frac{3}{4}$  feet.

**Loch na Dal**, the entrance to which is  $\frac{3}{4}$  mile northward of Isle Ornsay, extends northwestward about  $1\frac{1}{4}$  miles; there are depths of 7 to 8 fathoms (12.8 to 14.6 m.) in its entrance, but it quickly shoals within, and its inner half is choked with rocky shoals.

The coast of Skye from Fork Rock, nearly 200 yards off the eastern entrance point of Loch na Dal, trends eastward 5 miles to the entrance of Kyle Rhea River, where Kyle Rhea commences, and the width of the sound at nearly 2 miles eastward of Fork Rock narrows to about a mile. Sgeir Chulaih, a rock drying 6 feet (1.8 m.) lies 1.3 miles eastward of Fork Rock, and about 250 yards offshore; Bernera Barracks open southward of the land leads southward of the rock. Shoal water extends about 300 yards offshore in places between Fork Rock and Sgeir Chulaih. Tralcach, a small rock dry-

ing 11 feet (3.4 m.) lies 1,000 yards eastward of Sgeir Chulaih and 100 yards offshore. The coast eastward of Tralcach Rock is steep-to, at the distance of 100 yards, to Dun Ruaige, a cliffy point, 82 feet (25 m.) high, situated 1 mile south-southwestward of the entrance to Kyle Rhea, and off which rocky ledges extend nearly 100 yards.

**The coast of the mainland.**—Continued from page 305.

**Mallaig Harbor** is a small bight on the eastern side of Harbor Point, about 400 yards in depth to the southward, which affords shelter to small vessels in southwesterly gales. The land at the back of Mallaig is about 300 feet (91.4 m.) high, and the hotel and buildings connected with the railroad in the southwestern corner of the bay are conspicuous from seaward.

**Depths.**—In the harbor there are 4 to 5 fathoms (7.3 to 9.1 m.) water, but a bar with 3 fathoms (5.5 m.) stretches across the entrance.

**Red Rocks.**—A shoal, with from  $2\frac{1}{2}$  to  $3\frac{1}{4}$  fathoms (4.6 to 5.9 m.) water, on which the Red Rocks are situated, extends about 600 yards north-northeastward from Harbor Point, the western entrance point of the harbor and partly protects it.

Red Rocks ( $57^{\circ} 01' N.$ ,  $5^{\circ} 50' W.$ ) are awash at high water springs, and there is a channel on each side of them; that to the southward requires local knowledge.

**Lights.**—A fixed white light visible 5 miles is exhibited 20 feet (6.1 m.) above water from a beacon on the highest part of Red Rocks.

A fixed green light, visible 5 miles, is exhibited 25 feet (7.6 m.) above water from a post on White Point on the eastern side of the harbor entrance.

Two fixed red range lights are shown from the Railway Pier and in range indicate the channel eastward of Red Rocks. (For details see Light List.)

**Anchorage** is restricted to the head of the bay, as it is necessary to keep the approach to the Railway Pier clear. It is very confined and only suitable for small vessels.

**Railway pier.**—A concrete pier, alongside which steam vessels call and to the head of which the railroad extends, is situated on the western side of the bay. A steam vessel 250 feet in length can be berthed alongside the pier. The depth alongside is from 6 to 14 feet (1.8 to 4.3 m.). Vessels can lie alongside the southern side of the pier in any weather.

**Fish wharf**, at which vessels can lie in any weather, has a depth of from  $2\frac{1}{2}$  to 7 feet (0.8 to 2.1 m.) alongside.

From November to April and from May to August there are usually about 50 drifters working from Mallaig.

**Supplies.**—No stock of coal or fuel oil is maintained.

Water is laid on to the railroad pier and the fish wharf.

**Communications.**—The terminus of the North British Railway is at Mallaig, and there is daily steam communication with Portree and Stornoway, via Kyle of Lochalsh.

**Approach to Loch Nevis.**—The coast of Inverness from White Point trends eastward 3 miles to Rudha Moine. Mallaig Beg,  $\frac{1}{2}$  mile, and Mallaig More, 1 mile eastward of White Point, are two small bays. Sron Rainach is  $\frac{1}{2}$  mile farther eastward, and from it a bank, with heads of 5 fathoms (9.1 m.) and possibly less water, extends north-northeastward across the entrance to Loch Nevis.

A rock with  $2\frac{1}{2}$  fathoms (4.6 m.) water lies 200 yards off the north point of Eilean Giubhais, a small islet 40 feet (12.2 m.) high, situated close to the coast about  $1\frac{1}{4}$  miles eastward of Sron Rainach. At 300 yards east-northeastward of this islet and 100 yards off a projecting point is Bo Ruag, a large flat rock which dries 8 feet (2.4 m.). A large flat rock which dries 14 feet (4.3 m.) lies 300 yards farther east-northeastward and 100 yards offshore.

Port Giubhais, on the eastern side of Eilean Giubhais, is a little cove suitable for boats or small fishing craft. The land in this vicinity should not be approached, except by small craft, within 400 yards.

**Ru na Fhaochag**,  $3\frac{1}{2}$  miles north-northeastward of Mallaig Harbor, is on the southeastern side of Sleat Sound and on the northeastern side of the approach to Loch Nevis. It is steep-to and prominent. The coast trends southward 1.4 miles from the point to the western entrance point of Sandaig Bay and is steep-to.

**Sandaig Bay.**—Several rocks lie along and as much as 400 yards off the eastern shore of Sandaig Bay, which, together with the outer rocks and its being open to the westward, render it an unsafe anchorage.

**Eilean Dearg** (Heath Island) ( $57^{\circ} 03' N.$ ,  $5^{\circ} 47' W.$ ), small, rocky, 67 feet (20.4 m.) high, and covered with heather, is situated about 350 yards off the western point of Sandaig Bay, from which it is separated by a narrow channel only available for boats; two small islands contract this channel.

**Eilean Glas** (Eilean Liath) is a small rocky islet, 67 feet (20.7 m.) high and covered with long grass, situated about 600 yards southward of Eilean Dearg.

**Sgeir nan Eun** (Bird Rock) lies 250 yards off the northeastern side of Eilean Glas and dries 14 feet (4.3 m.).

A bank with a depth of 5 fathoms (9.1 m.) lies 600 yards eastward of Eilean Glas.

**Rudha Raonuill**, the northern point of the entrance to Loch Nevis, is a rocky peninsula, 50 feet (15.2 m.) high, jutting out from Roinn Raonuill, about half way along its southern shore. The remarkable hilly peninsula of Roinn Raonuill extends  $\frac{3}{4}$  mile east

and west, and is about  $\frac{1}{4}$  mile across north and south. A deep narrow valley separates it from the hills to the northward. It is very hilly, steep, and 338 feet (103.0 m.) high.

**Bogha cas Sruth**, the southwesternmost rock off Roinn Raonuill, dries  $4\frac{1}{4}$  feet (1.3 m.). It is situated 800 yards  $265^\circ$  from Rudha More, the southwestern extremity of Roinn Raonuill. A rocky head lies 65 yards southeastward from the beacon and dries 1 foot (0.3 m.).

Several rocks lie off the southern coast of Roinn Raonuill, but all within the distance of 400 yards. Smyth Rock, with 5 fathoms (9.1 m.) water, but on which less may exist, is situated 350 yards south-southeastward of Rudha Raonuill.

**Range marks.**—The beacon on Bogha Don (below) in range with Inverie Church, bearing  $75^\circ$ , leads southward of Bogha cas Sruth and over the rocky bank extending northeastward from Sron Raineach, in 8 fathoms (14.6 m.) least water.

**Loch Nevis**, the entrance to which is between Roinn Raonuill ( $57^\circ 02' N.$ ,  $5^\circ 45' W.$ ) on the north and the land westward of Rudha Moine on the south, has one good anchorage for large vessels, and several for coasters. The loch trends southeastward with a width of from  $1\frac{1}{4}$  miles to 1 mile, about  $4\frac{1}{2}$  miles to the narrows, and thence, with a width of about 800 yards, eastward  $3\frac{1}{2}$  miles to its head.

The winds are very baffling in the loch even in the finest weather, but during gales, or even fresh winds, there is much danger to sailing vessels, for the squalls are violent in force and uncertain in direction; those accompanying southeast and southwest winds are the worst at the entrance, and those with easterly winds in the upper loch; but, in any strong winds, it is a dangerous place for boats, and loss of life is not uncommon.

**Depths.**—The approach to the loch northeastward of Sron Raineach has a least depth of 7 fathoms (12.8 m.) in the fairway. In the entrance, though only 1,200 yards wide, and though shoal for some little distance off each shore, there is a channel 500 yards wide with from 50 to 70 fathoms (91.4 to 128 m.) water. In the narrows, the navigable channel is only about 130 yards wide for fully 1 mile, and has a least depth of  $2\frac{1}{4}$  fathoms (4.1 m.).

**Inverie Bay**, the best anchorage in Loch Nevis, is  $1\frac{3}{4}$  miles across between Roinn Raonuill and Rudha na Cruaidh to the eastward, and extends northward  $\frac{3}{4}$  mile.

Glaschoille House and Scoteis Farm are the only buildings on the northwestern shore. The Manse, several cottages, and the church near the eastern end of the bay, at Inverie, are conspicuous. Inverie House, surrounded by woods, stands close to the shore about 800 yards southward of the church.

A small sloping concrete pier near the post office at Inverie facilitates landing, and off it lies a yacht's mooring buoy, which should be looked out for by small vessels approaching after dark. Landing is bad with southerly winds.

A considerable bight lies between the point on which is the church and Rudha na Cruaidh, and a bank of sand dries off at low water almost to a line between these points.

**Bogha Don**, situated 300 yards east-southeastward from Rudha an t Salainn, the southeastern point of Roinn Raonuill, dries 3 feet (0.9 m.). It is marked by a concrete beacon, about 7 feet (2.1 m.) high, surmounted by a cross. The water is shoal for 150 yards south-eastward from the beacon, beyond which the water is deep.

Scoteis Farmhouse in range with the beacon on Sgeir Dearg, 32°, leads 200 yards southeastward of Bogha Don.

**Sgeir Dearg** (57° 02' N., 5° 43' W.), situated 700 yards 55° from Bogha Don, is a double rock, the outer part of which dries 10 feet (3.1 m.), and is marked by an iron tripod beacon with a small square top mark.

Scoteis Farmhouse, bearing 20°, leads southeastward, and Glaschoille House, bearing 308°, leads northeastward of the rock in deep water. The beacon on Bogha Don open of the extremity of the land at Mallaig, leads southward of it.

**Eilean Cruinn** is a small islet, 28 feet (8.5 m.) high, lying about 200 yards offshore near Glaschoille House and on the edge of the drying line of Ob na Dollaid.

**Anchorage.**—The most sheltered anchorage in Inverie Bay is northward of Sgeir Dearg, between Glaschoille House and Scoteis Farm. Approach with Glaschoille House bearing 290°, and anchor as convenient when the beacon on Sgeir is in range with Rudha Moine, avoiding the comparatively shoal spots about 400 yards north-northeastward of Sgeir Dearg, as the bottom there is rock. Anchorage can be taken anywhere in the eastern part of Inverie Bay.

**Communications.**—Mails are sent and received twice a week. The postal address is Knoydart, Mallaig, S. O. Inverness-shire. There is communication by telegraph.

**Supplies** are not obtainable without long notice.

**The shore** of Loch Nevis trends southward 1¾ miles from Rudha Moine and then turns southeastward 2¾ miles to Tarbet Bay.

Southward of Rudha Moine are several outlying shoals, and it is necessary to give a berth of 400 yards to this shore in a large vessel.

**Tarbet Bay** is close to the narrows leading into the upper part of the loch. It is a snug place for small vessels in from 4 to 6 fathoms (7.3 to 11 m.), but during southwesterly winds squalls are very frequent.

**The Narrows** ( $56^{\circ} 59' \text{ N.}$ ,  $5^{\circ} 36' \text{ W.}$ ) trend eastward for a mile, and the navigable channel is about 130 yards wide. A sunken rock lies nearly in the middle.

**The upper part of the loch** extends  $2\frac{1}{2}$  miles above the narrows. Bogha an Tachard, a sunken rock, lies nearly 800 yards within the Narrows 300 yards from the northern shore. A cottage on the northern shore of the Narrows open of the point eastward of it leads southward of the rock.

**Tides and tidal currents.**—It is high water, full and change, in Loch Nevis at 5h. 47m.; springs rise  $14\frac{1}{2}$  feet, neaps 10 feet.

Northward of Mallaig Harbor the current runs eastward during the rising, and westward during the falling tide, but strong easterly winds retard the east-going current. The rate of these currents seldom exceed 1 knot.

Between Rudha Raonuill and Rudha Moine the rate is  $\frac{1}{2}$  knot at springs, and currents turn at the same time as those northward of Mallaig Harbor.

Farther up the loch the currents are very weak until near the narrows, when the currents attain a rate of about 1 knot at springs, turning also at the same time as northward of Mallaig Harbor. The tidal currents rush through the narrows at a rate of 5 knots.

Both currents set round the shore of Inverie Bay at a rate of about  $\frac{1}{2}$  knot.

**Directions for Loch Nevis.**—In a vessel of heavy draft cross the rocky bank which extends north-northeastward from Sron Raineach with Bogha Don Beacon in range with Inverie Church, bearing  $75^{\circ}$ , or with Bogha Don Beacon on this bearing.

In thick weather, when the church is not visible or the beacon not distinguished, if the extremity of Roinn Raonuill can be made out, a vessel can cross the bank, which is narrow, in the same range by keeping it bearing  $72^{\circ}$ . It will be necessary to see Eilean Glas to determine when the bank has been crossed, as the course must then be altered.

When Eilean Dearg opens eastward of Eilean Glas the bank is crossed. Then steer for the middle of the entrance to the loch until Bogha Don Beacon is in range with the eastern extremity of Roinn Raonuill, when steer for the Manse. Avoid Sgeir Dearg and approach the anchorage as above directed.

If bound higher up the loch, the plan is the best guide, but the narrows should not be attempted without a pilot.

**The southeastern shore** of Sleat Sound from Ru na Fhaochag trends northeastward 4 miles to Rudha Ard Slisnech, which is the southern entrance point of Loch Hourn.

**Airor Island** ( $57^{\circ} 05' \text{ N.}$ ,  $4^{\circ} 46' \text{ W.}$ ), small and 27 feet (8.2 m.) high, is connected at low water to the shore  $1\frac{1}{2}$  miles north-north-

eastward of Ru na Fhaochag; there is a little bay southward of the island which affords shelter to boats and where there is a pier. Foul ground extends 400 yards northeastward from the island.

**Samadalan Island**, 14 feet (4.3 m.) high, is nearly 1 mile north-eastward of Airor Island and 400 yards offshore, to which it is connected at low water.

About 1,400 yards northeastward of Samadalan Island is Glen Ghuserein, through which runs Ghuserein River. The deposit from the river has formed a large spit of gravel which dries for 600 yards off its mouth at low water.

**Approach to Loch Hourn.**—The approach to Loch Hourn between Rudha Ard Slisneach on the southwest and Rudha More on the northeast is about  $2\frac{3}{4}$  miles wide. The southern shore from Rudha Ard Slisneach trends east-northeastward  $2\frac{1}{2}$  miles to Ru ard Munach, and the northern shore from Rudha More southeastward  $1\frac{1}{2}$  miles to Ru Camus na Cean.

A patch with 1 fathom (1.8 m.) water lies 300 yards offshore 700 yards eastward of Rudha Ard Slisneach. Shoal water extends 300 yards off the shore for 600 or 800 yards southward of Rudha More.

**Sgeir Ulibhe** ( $57^{\circ} 08' N.$ ,  $5^{\circ} 41' W.$ ), a small rock, drying 6 feet (1.8 m.), lies 1,500 yards southwestward of Ru Camus na Cean. About 200 yards northwestward of it is a rock which is awash at low water, and about the same distance to the southwestward there is  $1\frac{1}{2}$  fathoms (2.7 m.) water.

**Beacon.**—An iron beacon surmounted by a ball 15 feet (4.6 m.) above high water and painted black, stands on Sgeir Ulibhe.

**Clansman Rock** lies midway between Sgeir Ulibhe and the northern shore; it is a narrow ridge 550 yards long northwest and southeast, with  $1\frac{1}{2}$  fathoms (2.7 m.) water on its northwestern end, about 5 fathoms (9.1 m.) on its southeastern end, and from 8 to 13 fathoms (14.6 to 23.8 m.) between.

Eilean Rarsaidh just shut in with Ru Camus na Cean,  $92^{\circ}$ , leads close northward of the  $1\frac{1}{2}$ -fathom (2.7 m.) patch.

**Loch Hourn.**—The entrance to this loch is between Ru Ard Munach on the south and Ru Camus na Cean on the north, which are 1,800 yards apart; both shores are steep-to, and the central depths are from 80 to 100 fathoms (146.3 to 182.9 m.).

Loch Hourn trends southeastward  $2\frac{1}{2}$  miles; it then turns southward  $2\frac{1}{2}$  miles, and then abruptly eastward a farther distance of about 5 miles, passing through four narrows, to its head; the upper part of the loch within the first narrows being named Loch Hourn Beg.

Loch Hourn has about the heaviest rainfall of any loch in the Highlands. From the great height and close proximity of its sur-



rounding mountains it is a gloomy place when the clouds hang low on the mountain sides.

**Depths.**—The outer half of the loch averages 1 mile in width and has depths of from 90 to 56 fathoms (164.6 to 102.4 m.) in the central parts until abreast of Rudha Ruadh,  $1\frac{3}{4}$  miles east-north-eastward of Ru Ard Munach, above which to near the Còrr Islets, in the entrance to the first narrows, the depths are from 50 to 25 fathoms (91.4 to 45.7 m.).

The southern shore as far as Rudha Ruadh is steep-to, but within that point, on both shores, the water runs off sufficiently shoal for anchorage in many places.

The first three narrows are navigable for vessels of 20 feet (6.1 m.) draft at high water, but the fourth, less than 1 mile from the loch head, has a depth of 3 feet (0.9 m.) at low water, and is very narrow, though above it is a basin 700 yards long and 300 yards wide, with from 5 to 10 fathoms (9.1 to 18.3 m.) water.

**Ben Sgriol**, on the northern shore,  $2\frac{3}{4}$  miles eastward of Ru Camus na Cean, rises precipitously to a height of 3,189 feet (972 m.), its southern face being marked by many parallel watercourses, through which large boulders, becoming detached in wet weather, drop down nearly to the sea.

**Eilean Rarsaidh** ( $57^{\circ} 09' N.$ ,  $5^{\circ} 37' W.$ ), about 150 yards off the northern shore,  $1\frac{1}{4}$  miles eastward of Ru Camus na Cean, is the western of a cluster of small islands which extend 1,400 yards eastward. Eilean a Chuilinn lies 600 yards southeastward of Eilean Rarsaidh and 400 yards offshore. Eilean Mhairtein, the easternmost island is close to shore and a reef, midway between it and Eilean a Chuilinn, projects southward from the shore 400 yards. Eilean Rarsaidh is 105 feet (32 m.) high, and small vessels find shelter under its lee in all winds, but in the anchorage are Bo Beg and Bo More, two rocks close together, which dry.

**Dry Island** (Eilean Tioram), attached at low water to a projecting point, 1.4 miles above Eilean Rarsaidh, is 85 feet (25.9 m.) high, and has a large white mark on its sea face.

**Camus Ban**, eastward of Dry Island, is the first good anchorage within the loch.

The village of Arnisdale skirts the shore of the bay.

The anchorage is immediately abreast the middle of the village in 9 fathoms (16.5 m.) mud; but a long ship should anchor rather farther out in about 12 fathoms (21.9 m.), as the water shoals suddenly. Southerly winds send in some sea. Corran village, where Arnisdale River flows into the loch, is  $\frac{3}{4}$  mile southeastward from Eilean Tioram.

**Sgeir Laven** (Corr Eilean), rather more than 1 mile southward from Dry Island and 400 yards from the eastern shore, is a small gray rocky islet 12 feet (3.7 m.) high. There is deep water at 200 yards around it.

**Eilean a Phiobaire** (Piper Island) is situated 700 yards southward of Rudha Ruadh; a shoal dries 100 yards northwestward and 250 yards southward and eastward from it. There is a 2-fathom (3.7 m.) channel between it and the shore.

**Poll a Mhuineil**, 1 mile southward of Eilean Lee, is a bay 500 yards wide in its entrance and extending 700 yards southward; there is a depth of 15 fathoms (27.4 m.), mud, in the middle of the bay, whence the water shoals gradually to the shore.

**Corr Islets**, two in number, 600 yards westward of the entrance to Loch Hourn Beg, extend  $\frac{1}{4}$  mile from the northern shore. The southern islet is 50 feet (15.2 m.) high, and the main channel of the first narrows is on its southern side, which is steep-to.

There is also a channel northward of the northern Corr Islet, but it should not be taken except at high water. There is no channel, except for boats, between the islets.

**Duncan Shoal**, a bank of large stones and sand with 3 feet (0.9 m.) water, lies about 200 yards northward of the northern Corr Islet.

**Ellice Shoal**, 800 yards  $277^{\circ}$  from the southern Corr, and in mid-channel, is a shoal of rock with patches of sand and a depth of 6 feet (1.8 m.) water.

Eilean Tioram seen over Sgeir Laven,  $331^{\circ}$ , and Eilean a Gharbh-lain touching the northern end of North Corr Island,  $81^{\circ}$ , mark the position of Ellice Shoal.

**Barrisdale Bay**, southward of the Corr Islets, is very shallow, the sand at low water drying 800 yards from the shore.

**Eilean a Gharbh-lain** ( $57^{\circ} 06' N.$ ,  $5^{\circ} 31' W.$ ), 67 feet (20.4 m.) high, is  $\frac{1}{4}$  mile eastward of the Corr Islets and is connected with the northern shore at low water. Between it and the Corr Islets is good anchorage in 9 fathoms (16.5 m.), mud. On the southern shore opposite are two islets: Eilean Choinnich, the western, is only a few feet high and was formerly used as a burial place for Roman Catholics. Northward of this islet the sand dries out 200 yards, reducing the channel to about 170 yards in width. Eilean Fraoch, the eastern islet, is steep-to on its northeastern side, but both islets are connected with the shore at low water.

**Loch Hourn Beg**, above these narrows, is surrounded by high steep mountains, clothed on the northern side with wood, which fall precipitously and exclude the sun from its shore during the winter.

**Cnoc of Kyle**, 1 mile above Eilean a Gharbh-lain, is a low point extending from the northern shore, with a wooded rocky knoll on its inner part. Off this low point is a gravel spit of considerable size, which narrows Caolas More, the channel of the second narrows, to 100 yards; the southern shore of the channel is moderately steep-to.

**Eilean Mounsgra**, about 1 mile above the Cnoc of Kyle, lies 100 yards from a projecting point on the northern shore; it is 50 feet (15.2 m.) high, and steep-to on the southern side, but there is only a boat channel close to the islet on its northern side. A rocky spit, with a depth of from  $1\frac{1}{4}$  to  $1\frac{3}{4}$  fathoms (2.3 to 3.2 m.), extends 100 yards southwestward from the islet.

About 300 feet eastward of Eilean Mounsgra is **Island Rock**, which dries  $7\frac{1}{2}$  feet (2.3 m.).

From the point on the southern shore immediately abreast of Eilean Mounsgra, the low-water line extends 100 yards, so that the navigable channel of the third narrows here is much contracted.

**Skiary** ( $57^{\circ} 06' N.$ ,  $5^{\circ} 25' W.$ ) is a small village on the southern shore nearly a mile above Eilean Mounsgra, and off it is a good anchorage, where the squalls are said to be less violent than in any other part of the loch. Above Skiary, the water flows for over 1 mile, and within the fourth narrows there is a basin with from 5 to 10 fathoms (9.1 to 18.3 m.) water. This basin is called **Loch Hourn Head**.

**Tides and tidal currents.**—It is high water, full and change, at Camus Ban at 5h. 45m.; springs rise  $13\frac{3}{4}$  feet, neaps  $10\frac{1}{4}$  feet; neaps range  $6\frac{3}{4}$  feet.

The current runs into the loch during the rising and out during the falling tide. The currents in the loch are weak until near the Corr Islets, where the rate increases, and they run through the first narrows at a rate of 3 knots at springs, the in-going current being principally on the northern side of the narrows and causing an eddy on the southern side.

The flood current is retarded after rain on the hills.

**Directions.**—From the southward, keep from 600 to 1,000 yards from the southern shore and pass well northward of the 1-fathom (0.3 m.) patch eastward of Rudha Ard Slisneach, and also well southward of Sgeir Ulibhe.

From the northward, pass westward and southward of Ulibhe Beacon, giving its western side a wide berth. Steer up the loch and pass about 400 yards westward of Sgeir Laven, then steer  $152^{\circ}$ , keeping Sgeir Laven open eastward of Eilean Tioram until the Cnoc of Kyle is open southward of the southern Corr Islet, to clear Ellice Shoal.

Then steer to pass close on the southern side of the southern Corr Islet, and also close to Eilean a Gharbh-lain. From Eilean a Gharbh-lain, edge over toward the southern shore, and pass through Caolas More, well over on its southern side, and with the ebb current starboarding the helm quickly after passing the narrowest part, as the current will take the vessel on the port bow.

From Caolas More steer eastward to Eilean Mounsgra, and then proceed in mid-channel of the third narrows between the islet and the spit which extends from the southern shore of the loch opposite to it. Within these narrows an easterly course leads to Skiary, where there is good anchorage in a moderate depth of water.

No vessel should enter the fourth narrows (above Skiary) without a pilot.

When working up the loch, a vessel can reach the anchorage of Camus Ban by giving both shores a moderate berth; but in working higher up, the southeastern side of Eilean a Phiobaire must be avoided as well as Ellice Shoal.

Only the smallest vessels can work up above the Corr Islets.

**Caution** is necessary with southwesterly winds, as the squalls come down with violence and blow from all directions, lifting the surface of the water in a white foam.

**Sandaig Islands.**—Eilean More ( $57^{\circ} 10' N.$ ,  $5^{\circ} 42' W.$ ), northward of the approach to Loch Hourn, is about 250 yards in extent, grass covered, and 64 feet (19.5 m.) high; there are several small islets inside it, with some of which and with the mainland Eilean More is connected at low water.

**Light.**—A flashing white light, 40 feet (12.2 m.) above water, visible 11 miles, is shown from a white octagonal tower, 24 feet (7.3 m.) high, on the southwestern side of Eilean More.

**Sandaig Bay.**—Sgeir nan Eun, a large patch of sunken rocks, extends 350 yards  $137^{\circ}$  from the southern point of Eilean More. These rocks, together with Eilean More and the other islets, form the northwestern side of Sandaig Bay, which is 400 yards wide between them and Rudha More and extends about 900 yards northeastward; this little bay has from 7 to 3 fathoms (12.8 to 5.5 m.) water, sand bottom, but is quite open to southwesterly winds.

A rocky head with  $5\frac{3}{4}$  fathoms (10.5 m.) water lies about 470 yards  $220^{\circ}$  from the lighthouse on Eilean More, with depths of from 7 to 10 fathoms (12.8 to 18.3 m.) between.

**Sleat Sound—Northeastern part.**—Abreast of the Sandaig Islands, the width of Sleat Sound is rather over a mile, but  $1\frac{1}{4}$  miles farther northeastward it is 1,750 yards, this being the narrowest part until the sound merges into Kyle Rhea beyond Glenelg Bay.

The shore is steep-to from northward of the rocks off Sandaig north bay for upward of 2 miles until Glen Beg is approached, and it

becomes much higher, steeper, and more rocky than near Sandaig Islands.

**Glen Beg** is  $\frac{1}{2}$  mile south-southwestward of Glenelg Bay Pier. Here a deposit of gravel and sand from Eilean Reach River extends 400 yards from the shore. Bernera Barracks open off Glenelg Pier,  $50^\circ$ , leads northward of this shoal.

**Glenelg Bay** lies about  $\frac{3}{4}$  mile north-northeastward of Glen Beg, and Glen More River flows into it. About 150 yards back from the beach on the northern side of the river entrance is the Free Church manse, a yellowish colored building, standing on slightly rising ground; and on the flat ground on the southern side of the river entrance are the tall ruins of Bernera Barracks. Farther south, near the shore, are the hotel and church of Kirkton; the hotel is a large building of gray stone; the church is partly hidden amongst trees. There is a small pier for boats just southward of the entrance to Glen More River; it is dry at low water.

The mail steamers between Mallig and Portree call daily, except Sundays.

There is a post and telegraph office at Glenelg ( $57^\circ 13' N.$ ,  $5^\circ 37' W.$ ). The postal address is Glenelg, Kyle.

**Bo Beg**, a rock with 6 feet (1.8 m.) of water, lies about 150 yards westward of the pier; the church open northward,  $94^\circ$ , leads northward of it. At high water Glenelg and Bernera Bays are deceiving, as the low-water line dries off 400 yards in places.

**Anchorage** may be obtained in Glenelg Bay in 15 fathoms (27.4 m.), with the pier bearing  $108^\circ$  distant 400 yards.

Both the flood and ebb currents here set along the shore to the northward from  $\frac{1}{2}$  to  $1\frac{1}{2}$  knots.

**Bernera Bay** lies northward of Glenelg Bay, and on its northern side better anchorage can be obtained in 10 fathoms (18.3 m.), sand and shells, with a ruined house, near the beach in the middle of the bay, bearing  $20^\circ$ . This anchorage is open to southwesterly winds, but it is out of the tidal current. Both flood and ebb currents set along the shore to the northward at a rate of from  $\frac{1}{2}$  to 1 knot.

**Western shore of approach to Kyle Rhea.**—The shore from Dun Ruaige trends north-northeastward for about a mile to the western point of the southern entrance to Kyle Rhea, 200 yards within which is the West Ferry House, a conspicuous two-storied building.

About  $\frac{3}{4}$  mile northward of Dun Ruaige, Kyle Rhea River falls into the sound, and there is a large area of partly cultivated and meadow land on the northern side of its entrance; there are several cottages in this locality. A considerable bank extends off the shore from  $\frac{1}{4}$  mile northward of Dun Ruaige to the West Ferry House, its 3-fathom (5.5 m.) curve being 500 yards off the mouth of the river, the bank drying at low water for half that distance.

The 5-fathom (9.1 m.) curve is 750 yards southeastward from the mouth of the river. A rock with 5 fathoms (9.1 m.) water lies 580 yards  $127^{\circ}$  from the West Ferry House, and a patch with  $4\frac{3}{4}$  fathoms (8.7 m.) water 350 yards  $97^{\circ}$  from the same house.

**Anchorage** in about 11 fathoms (20.1 m.), mud, and out of the tidal current, can be obtained southward of the bank extending off Kyle Rhea River entrance, with a sheepfold bearing  $305^{\circ}$ , and Eilean More just open of the low-water rocks off Dun Ruaige. ( $57^{\circ} 13' N.$ ,  $5^{\circ} 40' W.$ )

A vessel can await the turn of the current here; the anchorage is sheltered from southwesterly winds, but with northwesterly winds violent gusts blow down the valley; the holding ground is good.

**Tides and tidal currents.**—In Sleat Sound generally it is high water, full and change, at about 5h. 50m.; springs rise 14 to 15 feet, neaps 10 to 11 feet. The currents turn almost simultaneously through Sleat Sound, running to the northeastward from  $5\frac{1}{2}$  hours before until half an hour after high water, and to the southwestward from half an hour after high water until  $5\frac{1}{2}$  hours before the next high water. To the southward of the Sandaig Islands the rate of the currents is from 1 to  $1\frac{1}{2}$  knots; they become rapid in Kyle Rhea.

**Directions for Sleat Sound.**—From the southwestward by day the chart is a sufficient guide. At night, between Eigg Island and the mainland, keep Ardnamurchan Light open to clear the rocks off and northeastward of Arisaig Harbor.

Eilean More (Sandaig Islands) Light bearing about  $38^{\circ}$  leads up Sleat Sound; Isle Ornsay Light open clears the shoals off Skye, but as Knock Bay is approached keep in mid-channel and note that the light is in sight from Tartar Rock.

Northeastward of Isle Ornsay, its light bearing about  $228^{\circ}$ , leads into Glenelg Bay, and when from 1 to  $1\frac{1}{2}$  miles from that bay, Kyle Rhea Light white sector will open. It changes to red when it bears  $345^{\circ}$  and shows a red sector of  $7^{\circ}$  over the fairway into Kyle Rhea southern entrance, the light changing to green when it bears  $338^{\circ}$ . (See Light List.)

**Kyle Rhea** ( $57^{\circ} 14' N.$ ,  $5^{\circ} 39' W.$ ) is the channel, 2 miles long, which trends northward from Sleat Sound and turns northeastward into Loch Alsh. Its southern entrance has a width of a little less than 200 yards, with depths over 5 fathoms (9.1 m.), which increases to 450 yards through the greater part of the Kyle and to 600 yards near its northern entrance. The land on both sides is high and steep with a smooth surface, except where intersected by wooded burns. The eastern shore is generally low cliffs.

**Depths.**—The greatest depth in the narrowest part is from  $5\frac{1}{4}$  to 10 fathoms (9.6 to 18.3 m.) and elsewhere the depths are from  $6\frac{1}{2}$  to 19 fathoms (11.9 to 34.8 m.) in the fairway.

Although the tidal currents in the Kyle are rapid, it is navigable by steam vessels of any size, but it should not be taken by square-rigged sailing vessels unless the wind is blowing right through it. Pilots may be obtained at the cottages at the southern entrance.

**Western shore.**—The 5-fathom (9.1 m.) curve is about 100 yards off the point east-northeastward of the West Ferry House, and it keeps that distance offshore northward to the light beacon. A  $4\frac{3}{4}$ -fathom (8.7 m.) shoal spot lies about 330 yards eastward from West Ferry House and 200 yards offshore. At 250 yards northward of the point is a pier with a road from it leading to Broadford and Isle Ornsay, and there are boats capable of conveying carriages or cattle across the Kyle to the East Ferry Pier. About 60 yards eastward of the West Ferry Pier is a rock awash at low water.

**Light.**—A fixed light with white, red, and green sectors, 22 feet (6.7 m.) above water, visible 9 miles, is shown from a white concrete beacon halfway between high and low water marks on the western shore about 1,400 yards northward of the West Ferry House.

The light is unwatched and, being of weak power, is subject to obscurity in thick weather. Reliance should not, therefore, be placed on it. (See Light List.)

The western shore trends northeastward about 1 mile from the light beacon and then turns gradually northward 700 yards to Rudha na Caillich, the western point of the northern entrance to the Kyle. The 5-fathom (9.1 m.) curve is 300 yards offshore at 900 yards north-northeastward of the light beacon.

**Research Rock.**—Nearly in mid-channel in the northern part of Kyle Rhea, is a patch 200 yards in extent, with depths of from  $3\frac{1}{2}$  to  $4\frac{3}{4}$  fathoms (6.4 to 8.7 m.). Research Rock, the shoalest head, with a least depth of  $3\frac{1}{2}$  fathoms (6.4 m.), is situated on the southwestern part of the patch, with Kyle Rhea Light beacon bearing  $225^\circ$ , distant 1,100 yards. Shoal water of less than 3 fathoms (5.5 m.) extends from the western shore to about 80 yards from the rock. The red sector shown from the light beacon covers the patch, but the southeastern limit of the sector leads over its eastern end in  $4\frac{3}{4}$  fathoms (8.7 m.) water. (See Light List.)

The summit of Dun Ruaig in range with the high-water mark of the low grassy northern entrance point to Kyle Rhea River, on the extremity of which there is a small white hut, bearing  $195^\circ$ , leads close eastward of Research Rock in 4 fathoms (7.3 m.) water.

**Rudha na Caillich** and the shoals northward of it, see page 345.

The eastern shore from Cuil a Mheannain ( $57^\circ 14' N.$ ,  $5^\circ 39' W.$ ), the northern point of Bernera Bay, trends west-northwest-

ward 600 yards, and then turns northward nearly  $\frac{1}{2}$  mile to a point 200 yards northward of Eilean Liath (Grey Islet), which is 17 feet (5.2 m.) high. About 200 yards northward of the western extremity of this land is the East Ferry Pier, with the East Ferry House, a two-storied building, on the shore 200 yards to the northward of it; the road leading to Inverness starts from the ferry house. The 5-fathom (9.1 m.) curve is nearly 200 yards off the shore west-northwestward of Cuil a Mheannain, as far as the East Ferry Pier, the ground inside it being foul and rocky. The south-going current sets directly over Sgeir na Loagh and the rocks around it, which lie within 150 yards westward of the East Ferry Pier; some of these rocks dry 3 feet (0.9 m.). To the northward of the pier, the 5-fathom (9.1 m.) curve is not more than 150 yards offshore.

**Tides and tidal currents.**—It is high water, full and change, at Kyle Rhea ferry piers at 6h. 0m.; springs rise  $15\frac{1}{2}$  feet, neaps 11 feet; neaps range  $6\frac{1}{2}$  feet.

The current in Kyle Rhea at springs runs to the northward during the rising tide and to the southward during the falling tide, but at neaps the north-going current runs from  $5\frac{1}{4}$  hours before until three-quarters of an hour after high water, and the south-going current from three-quarters of an hour after high water until  $5\frac{1}{4}$  hours before the next high water. These times are subject to a variation, which usually does not exceed a quarter of an hour, but in gales may be half an hour.

The greatest rate of the north-going current is 6 to 7 knots, and the south-going current 8 knots. The currents turn from one direction to the other with little or no intervals of actual slack water, but there is an interval of about 40 minutes between the times of the south-going current slackening to a rate of 2 knots and the north-going current attaining that rate, and of about 45 minutes from the time of the north-going current slackening to 2 knots and the south-going current attaining that rate.

The north-going current through Sleat Sound, with a rate of about 1 knot at springs, is on the western side diverted to the northeastward by the stony bank off Kyle Rhea River, northward of which an eddy forms, while on the eastern side the north-going current passes round Glenelg and Bernera Bays and takes a north-westerly direction. The whole body of water being then brought together at the southern entrance to the Kyle, and moving toward it from different directions forms strong whirls, which cause difficulty in steering. The north-going current presses toward the western shore of the Kyle, and a broad eddy forms on the eastern side from  $\frac{1}{2}$  mile northward of the East Ferry House to 400 yards southward of it.



The current after passing Kyle Rhea Light Beacon ( $57^{\circ} 17' \text{ N.}$ ,  $5^{\circ} 44' \text{ W.}$ ) is diverted toward the eastern shore of the Kyle, and a broad eddy forms on the western shore northward of the light beacon until the rocks in the Kyle are covered, when the current flows to the northward more regularly, and emerges into the deep water of Loch Alsh as a narrow and rapid current running into still water and causing eddies and overfalls more particularly near its edges, but rapidly decreasing in strength.

The south-going current approaches the northern entrance to the Kyle at a moderate rate from all directions, but on meeting the comparatively shoal water at its northern end pours over it and into the Kyle at a rate of 4 knots, being pressed toward the eastern shore a broad eddy forms on the western side from West Ferry Pier northward to Kyle Rhea Light Beacon. From abreast the light beacon the current rapidly increases in strength toward the southern entrance, where it attains a rate of 8 knots, and emerges into Sleat Sound as a narrow and rapid current, running like a river into comparatively still water, forming eddies at its edges, and especially heavy overfalls in the deep water south-southeastward of the entrance to Kyle Rhea River, which are dangerous to boats during southerly winds, but the strength of the current rapidly decreases on its entering deep water. On the eastern side an eddy runs northward along the shore of Glenelg Bay at a rate of nearly  $\frac{3}{4}$  knot, extending  $\frac{3}{4}$  mile from the mouth of Glenmore River, and on the western side an eddy is caused by the bank extending from the mouth of Kyle Rhea River.

The positions of the edges of the eddies at different times of the currents are marked on the chart.

**Directions.**—From southeastward of Dun Ruaige ( $57^{\circ} 13' \text{ N.}$ ,  $5^{\circ} 40' \text{ W.}$ ) steer north-northeastward, keeping Isle Ornsay Light-house open until the mouth of Kyle Rhea River bears  $310^{\circ}$ , and when Kyle Rhea Light beacon bears  $343^{\circ}$  steer through the southern entrance to the Kyle with it on this bearing. When the East Ferry-house bears  $70^{\circ}$  keep in mid-channel, but after passing the light beacon favor the eastern shore with the summit of Dun Ruaige slightly open to the south-southeastward of the high-water mark of the low grassy northern entrance point to Kyle Rhea River, to avoid Research Rock, until a small waterfall (difficult to distinguish) on the western shore bears  $278^{\circ}$ , when again keep in mid-channel.

From the northward steer south-southwestward in mid-channel through the Kyle until about 600 yards within Ru Ghurriban, the eastern entrance point, then favor the eastern shore and continue southwestward with the summit of Dun Ruaige slightly open southward of the high-water mark of the northern entrance point to Kyle

Rhea River. When the small waterfall on the western shore bears  $325^{\circ}$  again keeping in mid-channel, and after passing the light beacon bring it to bear  $343^{\circ}$ , which bearing on astern leads through the southern entrance, and when Isle Ornsay Lighthouse opens a vessel will be in deep water.

It is not advisable to take the Kyle at night without local knowledge. From the southward keep in the red sector of Kyle Rhea Light until well within the entrance and clear of the rocks off the East Ferry Pier. Then steer north-northeastward in mid-channel through the green sector of Kyle Rhea Light, and when northward of the light do not enter the red sector which shows over Research Rock until past that rock. Then again keep in mid-channel through the northeastern part of the Kyle.

**Caution.**—Unless the wind is blowing directly through the Kyle there is considerable risk in a sailing vessel attempting the narrows at the southern entrance against the south-going current, as, owing to the high lands on both sides, the wind is very variable both in force and direction, and should she be becalmed when near the eastern shore she would be in great danger of being thrown on the rocks off the East Ferry Pier. In a long steamer great caution is necessary in passing southward through these narrows, the chief danger in this case being the rocks near the West Ferryhouse.

Working through the Kyle can only be accomplished with a weather-going current; and, in a square-rigged vessel, the safest plan is to back and fill while passing through the narrows. In standing toward Kyle Rhea River keep the whole of Eilean More well open of Dun Ruaige. In standing toward Bernera and Glenelg Bays with the south-going current, keep the vessel well under command so as to insure staying, the eddies being very strong and uncertain.

**Loch Alsh**, the western portion of which separates the Isle of Skye from Ross Shire, extends eastward  $6\frac{1}{2}$  miles from Kyle Akin, its western entrance, to the entrances to Lochs Duich and Long, with a width of from 1 to  $1\frac{1}{2}$  miles, and general central depths of from 40 to 60 fathoms (73.2 to 109.7 m.) for two-thirds of its length. It is entered from the southward about its middle by Kyle Rhea. Kyle Akin, between Eilean nan Gillean and Doctor Rock, has a navigable width of 250 yards.

**Eastern part.**—The southern shore of Loch Alsh from Ru Ghuraban, the eastern point of the northern entrance to Kyle Rhea ( $57^{\circ} 15' N.$ ,  $5^{\circ} 38' W.$ ), eastward to Ardintoul Point, a distance of  $1\frac{1}{2}$  miles, is a gravel beach, from which the mountain Glas Ben rises, with deep but smooth sides, to the height of 1,288 feet (392.6 m.). The beach dries off 300 yards at low water, and the water then

suddenly deepens to from 20 to 30 fathoms (36.6 to 54.9 m.), leaving no bank for anchorage.

**Ardintoul Point** is low, flat, and cultivated, with a farmhouse on its eastern side. There is good anchorage in the bay eastward of the point in about 8 fathoms (14.6 m.) sand, but the point dries off about 200 yards; the southern shore of the bay dries off a similar distance and a shoal spit extends off 300 yards, deepening suddenly to 6 fathoms (11 m.), and leaving a narrow channel between the shore and the flat that dries southward from Glas Eilean.

**Ru Ard Madadh** is 1,800 yards eastward of Ardintoul Point; to the northward of it, extending from 100 to 300 yards from the point, is a rocky shoal, the rocks on its northwestern edge having 3 feet (0.9 m.) water. Westward of this shoal, between it and the edge of the flat drying off Glas Eilean, the channel is 200 yards wide. The shore eastward of Ru Ard Madadh to Ru na Totaig, at the entrance to Loch Duich, a distance of  $1\frac{1}{2}$  miles, is steep, rugged, and covered in many places with wood of natural growth.

**Ru Aird a Mhill** is on the northern shore of Loch Alsh, just over  $1\frac{1}{2}$  miles north-northeastward of Ru Ghurraban, and Aird a Mhill Bay lies between it and Ru Sgarabhaig, 1,700 yards farther eastward. Ru Aird a Mhill is a steep grassy point rising to a height of 265 feet (80.8 m.) with but little low-water line extending from it. A flat of mud and sand dries out fully  $\frac{1}{4}$  mile from the head of the bay; the Established Church is 700 yards within the head. The bay is open to southwesterly winds, and the water is too deep for anchorage.

**Ru Sgarabhaig** (Scart Point) has two points; the eastern one is deceptive at high water, the rocks which dry over 100 yards from it being then covered.

From this point the northern shore eastward  $2\frac{1}{4}$  miles to Ardelve Point, at the entrance to Loch Long, is only moderately bold, with many small bays and shallow inlets.

**Ais Sgeir**, a bare black rock, 4 feet (1.2 m.) high, lies 100 yards from the northern shore,  $1\frac{1}{2}$  miles above Ru Sgarabhaig.

**Ardelve Point** ( $57^{\circ} 17' N.$ ,  $5^{\circ} 31' W.$ ) is a low point on the northern shore at the entrance to Loch Long, and on the rising ground above it is Tigh an Aisig (Ferry House), a gray stone building. Off Ardelve Point, and connected with it at low water by a gravel spit, is Eilean Tioram, the bank on which the island stands drying 500 yards to the southward and about 800 yards to the westward.

**Glas Eilean**, a green flat island, 12 feet (3.7 m.) high, in the middle of Loch Alsh, a little east-northeastward of a line joining Ardintoul Point and Ru Sgarabhaig, is surrounded by a bank ex-

tending more than 200 yards northward, eastward and westward, and nearly 600 yards southward of it, but leaving a navigable channel on either side, the northern being straighter, wider, and easier to navigate than the southern.

**Racoon Rock**, with 6 feet (1.8 m.) water, lies rather more than 400 yards from the high-water line of the northwestern part of Glas Eilean, and 400 yards southeastward from Ru Sgarabhaig; Tigh an Aisig in range with Ais Sgeir  $74^{\circ}$ , leads between Glas Eilean and the main, but close to the rocks off Ru Sgarabhaig and Racoon Rock. A red conical buoy is moored northwestward of Racoon Rock.

**Larach Tigh Mhic Dhomhnuill** (Site of McDonald's Houses) is a rocky shoal, which dries 5 feet (1.5 m.) situated 600 yards eastward of Glas Eilean, with a deep channel between.

**Nosue Bank**, with 3 fathoms (5.5 m.) water, lies nearly in mid-channel about 1,400 yards eastward of Glas Eilean.

The northern extremity of Eilean Ainidh in range with the first point southward of the hill 178 feet (54.3 m.) high near Donnan Castle bearing  $89^{\circ}$ , leads northward of the bank.

**Lochs Duich and Long** branch off from the eastern end of Loch Alsh, the former extending 5 miles southeastward, the latter about 4 miles northeastward; the entrance common to both being between Eilean Tiroam and Ru na Totaig.

**Loch Duich** is 700 yards wide just within its entrance, but the width increases to over 1 mile toward the head. Its central depths generally are between 40 and 60 fathoms (73.2 to 109.7 m.); its shores are generally bold except at the head which is broken into several bays where flats dry out as much as 900 yards; outside the flats anchorage can be obtained in from 6 to 12 fathoms (11.0 to 21.9 m.), whence the soundings increase rapidly to 20 and 30 fathoms (36.6 to 54.9 m.).

Loch Duich is one of the most picturesque lochs in the Highlands, the shores being generally steep and partly covered with wood; around the head are several sharp peaked precipitous mountains from 2,000 to 3,000 feet (609.6 to 914.4 m.) high. It is seldom used by shipping, but when herrings are caught late in the season, number of boats and craft anchor in its bays.

**Aile More** is a small bank with 1 fathom (1.8 m.) least water, situated 200 yards northeastward from Ru na Totaig. The houses in Dornie masked by Caisteal Donnan,  $5^{\circ}$ , lead eastward of it.

Caisteal (Castle) Donnan ( $57^{\circ} 16' N.$ ,  $5^{\circ} 31' W.$ ) is a picturesque ruin covered with ivy, on an island connected at low water with the eastern shore at the confluence of Lochs Duich and Long.

**Tides.**—It is high water, full and change, at the entrance to Loch Duich at 6h. 0m.; springs rise  $15\frac{1}{2}$  feet, neaps 11 feet.

**Loch Long** has a very narrow entrance, with from  $1\frac{1}{4}$  to  $2\frac{1}{2}$  fathoms (1.9 to 4.6 m.) water; it opens out after the first  $\frac{1}{2}$  mile to a space about 1,400 yards long, with a width varying from 120 yards to 300 yards, and a depth of from 5 to 17 fathoms (9.1 to 31.1 m.). Above Ru Chruand,  $1\frac{1}{2}$  miles within the entrance, it narrows to about 130 yards, and becomes tortuous, and in places very shallow, and so continues to its head, excepting a small basin of deep water 1 mile from the head toward which the flats dry nearly the whole of the distance.

There is a considerable population on its eastern shore near the entrance.

**Dornie.**—The village of Dornie skirts the eastern shore of Loch Long entrance and has a number of stone-built houses; a Roman Catholic Chapel, school, and dwelling house stand at the northern end of the village; the roof and belfry of the chapel show over Ardelve Point. Vessels anchor immediately off the village, where the current is strong.

The trade is chiefly in coal, lime, and wool.

**Loch Alsh—Western part—Balmacara Bay.**—The northern shore of Loch Alsh trends northwestward  $1\frac{1}{4}$  miles from Ru Aird a Mhill to the head of Balmacara Bay; it then turns southwestward for about 1,200 yards.

Sgor Reraig ( $57^{\circ} 17' N.$ ,  $5^{\circ} 37' W.$ ), a mountain 1,115 feet (339.8 m.) high on the eastern side of the bay, and 1 mile northward of Ru Aird a Mhill, is partly encircled half way up by a belt of trees, and large red earth marks show out amongst the dark heather.

Balmacara Hotel (Reraig Inn), a gray stone building, stands near the sea at the foot and southwestward of Sgor Reraig; the stables are black thatched buildings on the beach a little southward of the hotel. The post and telegraph office is just westward of the hotel. The lodge, a square whitewashed cottage, stands about 800 yards west-northwestward of the hotel nearly under a high cliff. The road between the Kyle of Loch Alsh and Stromeferry passes by the lodge and the hotel. Balmacara House, large, white, and three storied, with a long frontage to the loch, is on the northern shore of the head of the bay; there are several cottages westward of it. There is an indifferent boat pier near the house, and westward of the pier is a gray stone house.

The shores of the bay are wooded.

Steamers between Oban and Portree call daily, except Sundays.

Shoal water of less than 5 fathoms (9.1 m.) extends from 200 to 400 yards off the shores of the bay. A rocky patch of  $2\frac{3}{4}$  fathoms (5 m.), with depths of  $3\frac{1}{4}$  fathoms (5.9 m.) for 100 yards south-

westward of it, lies 700 yards west-northwestward of Ru Aird a Mhill and 400 yards offshore.

The low-water line dries out about 300 yards off Balmacara House and also off the hotel.

**Anchorage** may be obtained in Balmacara Bay in from 10 to 12 fathoms (18.3 to 21.9 m.), with a wooden hut at the inner end of the pier bearing  $300^{\circ}$ ; the bottom is mud, but it deepens suddenly, and a vessel might be driven off the bank in the heavy northerly squalls. With southerly and southwesterly winds there is a short chopping sea which at times prevents communication with the shore.

**Murchison's Monument**, a white granite obelisk, 28 feet (8.5 m.) high, view on charts, stands on Ru Doire na Earba (Roe Point), a slightly projecting head  $\frac{1}{2}$  mile westward of the pier in Balmacara Bay; it is conspicuous. The base of the monument is 50 feet (15.2 m.) above high water.

**Bo Doire na Earba** (Roe Bank).—A bank on which there are general depths of from  $5\frac{1}{2}$  to 8 fathoms (10.1 to 14.6 m.) extends to a distance of 800 yards off the shore near Ru Doire na Earba, and at 500 yards southward from the point is Bo Doire na Earba, a patch with  $4\frac{1}{2}$  fathoms (8.2 m.) least water. Close off the bank the depths increase to from 30 to 50 fathoms (54.9 to 91.4 m.).

**The shore** from Ru Doire na Earba trends westward  $\frac{1}{2}$  mile to Sealpaiddh Bay, and shoal water extends from 100 to 150 yards off it, the bottom chiefly sand with sea grass.

**Sgeir Oighrig** ( $57^{\circ} 17' N.$ ,  $5^{\circ} 41' W.$ ) lies on the shoal flat off the middle of Scalpaiddh Bay nearly 300 yards from the shore, and dries  $4\frac{1}{2}$  feet (1.4 m.) at springs. The water shoals 100 yards southward of the rock, but very little outside the general trend of the coast. Balmacara Hotel open southward of Ru Doire na Earba,  $84^{\circ}$ , view on chart, leads southward of the shoals.

**Rudha na Caillich**, the northeastern termination of Ben na Caillich and the western point of the northern entrance to Kyle Rhea, is a low grassy point with some cultivation; 100 yards off it is a small rocky islet 9 feet (2.7 m.) high.

The southern shore of Loch Alsh trends northwestward from Rudha na Caillich about 1,200 yards to Rudha Buidhe (Yellow Point).

Shoal water of less than 5 fathoms (9.1 m.) extends from 250 to 800 yards off the shore between Rudha na Caillich and Rudha Buidhe.

**Sgeir na Caillich**, a rock which dries 13 feet (4 m.), lies 200 yards northward from the islet off Rudha na Caillich, with shoal water around except on its eastern side.

**Beacon.**—Sgeir na Caillich is marked by a black beacon with a barrel 12 feet (3.7 m.) high.

**Caillich Knoll** ( $57^{\circ} 16' N.$ ,  $5^{\circ} 39' W.$ ), a sandy shoal with 2 fathoms (3.7 m.) water, lies 400 yards  $354^{\circ}$  from the beacon on Sgeir na Caillich.

The southern limit of the white sector of Kyle Akin Light leads northward of the knoll and sgeir.

**Anchorage.**—There is good anchorage inside and northward of Caillich Knoll, especially in southerly and southwesterly gales. The bottom is sand and mud, and there is but little tidal current. Small vessels anchor in from 2 to 3 fathoms (3.7 to 5.5 m.) about 400 yards offshore, with Sgeir na Caillich beacon bearing between  $150^{\circ}$  and  $140^{\circ}$ , distant from 200 to 600 yards. Large vessels anchor in from 7 to 8 fathoms (12.8 to 14.6 m.) with the beacon bearing  $150^{\circ}$ , distant about 950 yards. Kyle Akin Light shows red over the anchorage.

The shore from Rudha Buidhe trends westward  $2\frac{3}{4}$  miles to the head of Loch na Beiste; it dries out in places at low water nearly 200 yards, and the 5-fathom (9.1 m.) curve is from 50 to 350 yards off it to the entrance to the loch.

**Bo Sron an Tairbh**, 400 yards northward of Sron an Tairbh (Bull's Nose),  $\frac{3}{4}$  mile westward of Rudha Buidhe, is a rocky patch with 4 fathoms (7.3 m.) water, having deep water close outside it and 7 to 8 fathoms (12.8 to 14.6 m.) between it and the shore.

**Loch na Beiste** is an inlet about  $\frac{1}{4}$  mile in width, and 1 mile in depth, situated southward of a projecting headland terminating in Rudha Ard Tresnish. Its shores are fairly bold and it is well sheltered, affording anchorage in 13 fathoms (23.8 m.) sand and shells, at 700 yards from its head ( $57^{\circ} 15' N.$ ,  $5^{\circ} 43' W.$ ).

**Tidal currents in Loch Alsh, Loch Duich, and Loch Long.**—It is high water, full and change, in these lochs at about 6h. 0m. They are open to the tidal wave and current approaching from the southward through Kyle Rhea, and also to the tidal wave and current approaching from the northward and through Kyle Akin, but the former of these currents has most effect, the currents through Kyle Akin being weak owing to the height of the water inside and outside that channel never varying sufficiently to cause any great inset or outset.

The current from Kyle Rhea running into Loch Alsh during the rising tide, after losing its great rate, sends off subsidiary currents in all directions to fill the lochs branching off Loch Alsh. One part moves westward toward Kyle Akin at a rate of from  $\frac{1}{2}$  to  $\frac{3}{4}$  knot; another part moves across to the northern shore of Loch Alsh; but the main portion takes a northeasterly direction, and, passing

through the channels northward and southward of Glas Eilean, fills Lochs Duich and Long, also at a rate of about  $\frac{3}{4}$  knot.

The currents out of Lochs Duich and Long run westward both northward and southward of Glas Eilean, and while a part moves toward Kyle Akin, the other part moves toward and through Kyle Rhea; but the rate of the currents in Loch Alsh, excepting near the entrance to Kyle Rhea, is always moderate, never exceeding 1 knot.

The current runs from Loch Alsh, both northward and southward of Glas Eilean, toward the entrance to Lochs Duich and Long, the east-going current passing through the narrows, which connects Loch Alsh with Lochs Duich and Long, strikes the land opposite, and one part turns up Loch Duich and the other up Loch Long. The current in Loch Duich has some rate on the eastern shore of that loch for about a mile, when it slackens, and farther up there is little or no current. Also the current diverted into Loch Long runs with a considerable rate over the bar at the entrance to that loch and past Dornie, but with a less rate in the wider and deeper parts.

The current sets into Lochs Duich and Long while the tide is rising, and out when the tide is falling.

**Kyle Akin** is the narrow but important channel, about  $1\frac{1}{2}$  miles in length eastward and westward, through which passes the inner traffic of the west coast of Scotland. It lies between the southwestern extremity of Ross-shire and the eastern part of the Isle of Skye, and connects Loch Alsh with Inner Sound. Eileanan Dubha lie in the eastern and Eilean nan Gilleán in the western entrance.

The coasts of the mainland and Skye are 700 yards apart at the narrowest place, about halfway between Eileanan Dubha and Eilean nan Gilleán, there being a clear space, 1,400 yards long, between these islands, where the depths are from 9 to 13 fathoms (16.5 to 23.8 m.), but at the eastern end shoal water extends 300 yards from the southern shore of the channel abreast Castle Maol, and String Rock narrows the navigable channel between it and Eileanan Dubha to little more than 200 yards, with from 5 to 8 fathoms (9.1 to 14.6 m.) water; at the western end, between Eilean nan Gilleán and the coast of Skye, it is less than 200 yards in width, with depths of from 9 to 14 fathoms (16.5 to 25.6 m.).

The northern shore of Loch Alsh from Scalpaidh Bay trends westward 1,200 yards to Kyle and Lochalsh Railway Pier in Kyle Akin. It is steep-to at the distance of 100 yards, except about 300 yards eastward of the pier, where rocks extend nearly 200 yards offshore, and the outer rock, with 5 feet (1.5 m.) water, about 100 yards within the 5-fathom (9.1 m.) curve, is marked by an iron perch.



Balmacara Hotel open southward of Ru Doire na Earba, 84°, leads southward of these rocks.

**Eileanan Dubha** (Black Islets), at the eastern end of Kyle Akin, are a group of two islets covered with heather, and two rocks above water, extending 600 yards eastward from the western islet, situated 300 yards southward of Kyle of Lochalsh Railway Pier. The middle and largest islet is 48 feet (14.6 m.) high, and the islets are steep-to, except off the northern end of the northeastern of the two eastern rocks, from which a ledge extends 100 feet.

The passage on the northern side of these islets has from 8 to 10 fathoms (14.6 to 18.3 m.) water, with a navigable width of 140 yards.

The tidal currents set fairly through this passage at a rate of from 1 to 1½ knots at springs.

**Telegraph cable.**—A telegraph cable crosses the Kyle to the eastward of the pier, each end being marked by a beacon on the shore.

**Kyle of Loch Alsh** (57° 17' N., 5° 44' W.), on the northern side of the Kyle and northward of the western Eilean Dubha, is a developing town, in which is the terminus of a branch from Dingwall of the Highland Railway.

The pier is a stone structure, extending southward 120 yards from the shore, and has a breadth of 224 feet. There are depths of from 15 to 19 feet (4.6 to 5.8 m.) alongside its outer end, and along each side the depth decreases from 19 feet to 9 feet (5.8 to 2.7 m.) at a distance of about 60 yards from the shore.

The railroad station is on the pier, and there are sidings along the sides with hydraulic cranes for transhipment of cargo.

**Lights.**—A fixed red light, visible 5 miles, on the west side, and a fixed green light, visible 4 miles, on the east side, are shown from Loch Alsh Pierhead. The lights are 19 feet (5.8 m.) above water.

**Communications.**—There is communication by railroad to all parts of Great Britain. Steamers between Mallaig and Portree call daily, except Sundays, at the Kyle of Lochalsh and Kyle Akin Piers, and from the former a steamer leaves daily direct for Stornoway.

**Coal.**—Coal can be obtained from the railroad company by giving a few days' notice.

**Water.**—Waterworks have been constructed on the hill above the town, and a supply of good water is laid down to the pier, for the use of steamers which call alongside in connection with the trains.

**The Plock of Kyle** is a peninsula, westward of Kyle of Lochalsh, and on the northern side of Kyle Akin. Rocks and shoal

water extend 150 yards off its southern side. The Station Hotel, 200 yards westward of Kyle of Lochalsh Pier, and close to the water, has three stories. A little eastward of it is the ferry pier.

**Eilean nan Gillean** ( $57^{\circ} 17' N.$ ,  $5^{\circ} 44' W.$ ), nearly in the middle of the western entrance to Loch Alsh and 350 yards westward of the Plock of Kyle, is in two parts connected with each other at low water. The larger and outer part is 56 feet (17.1 m.) high at its southwestern end, where are the dwelling of the lighthouse keepers and a signal station.

**Light.**—A fixed white light with red sectors, 53 feet (16.2 m.) above water, visible 12 miles, is shown from a white tower, 70 feet (21.3 m.) high, on the low-water rocks 53 yards southwestward from Eilean nan Gillean. The lighthouse is connected with the shore by a bridge. From the base of the lighthouse, the low-water line extends 40 yards into the channel, and at 100 yards distance there are 4 fathoms (7.3 m.) water.

**Bleat Island** lies  $\frac{1}{2}$  mile northward of Kyle Akin Lighthouse; it is surrounded by reefs and shoals, and between it and Eilean nan Gillean are Fork Rocks, some of which dry 3 feet (0.9 m.) and several other rocks above and below water. Blind Sound, the passage east-northeastward of these rocks, has been mistaken at high water for the entrance into Kyle Akin, but there is no ship channel through it.

**Carrach Rock**, the outer rock above water in this locality, situated  $\frac{1}{4}$  mile westward of the southern end of Bleat Island, is 7 feet (2.1 m.) high. A rocky patch, with 6 feet (1.8 m.) water, lies nearly 400 yards northwestward of Carrach Rock; West House, Kyleakin, in range with Kyle Akin Lighthouse,  $143^{\circ}$ , leads westward of it, and at night the rock is covered by the red sector of Kyle Akin Light.

**Southern shore—Rudha Ard Tresnish**, the southern point of the eastern entrance to Kyle Akin, is the extremity of a narrow peninsula, 44 feet (13.4 m.) high, jutting out north-northeastward 400 yards.

**Castle Maol.**—About  $\frac{1}{4}$  mile west-northwestward of Rudha Ard Tresnish are the ruins of Castle Maol, a square keep, or tower; its top is 94 feet (28.6 m.) above high water.

**String Rock**, awash at low water springs, is  $60^{\circ}$ , 400 yards from Castle Maol; foul ground extends about 75 yards around the rock, but between it and Castle Rocks the depth is from  $1\frac{3}{4}$  to  $2\frac{1}{4}$  fathoms (3.2 and 4.1 m.).

**Buoy.**—A black can buoy is moored in  $2\frac{1}{2}$  fathoms (4.6 m.) on the northern side of the rock.

**Castle Rocks** ( $57^{\circ} 16' N.$ ,  $5^{\circ} 43' W.$ ) are two rocky heads, drying 7 feet (2.1 m.), with a boat passage between them, situated

about 60 yards north-northeastward of the point on which is the castle. A rock with less than 6 feet (1.8 m.) water lies just over 200 yards northwestward of the castle, and there is shoal water of less than 3 fathoms (5.5 m.) for 100 yards northward of it.

The King's Arms Hotel, open northward of the Lump, 252°, leads northward of String Rock and close northward of the shoal ground off Castle Rocks.

**The Lump**, the eastern termination of Kyleakin Peninsula, 400 yards west-northwestward of Castle Maol, is a rocky knoll 45 feet (13.7 m.) high; around it are several small cottages. A stone pier extends eastward 140 yards from the eastern end of the Lump. At spring tides the water leaves the end of the pier but there are good berths with gravel bottom where small vessels can lie alongside.

A rock, nearly awash, lies 100 yards northward from the middle of the pier. Kyle House Stable, open northward of the boathouse westward of the King's Arms Hotel, 262°, leads northward of the rock.

Within and protected by the pier is a basin with 15 feet (4.6 m.) water, which is a good harbor for small vessels; there is a depth of 3 feet (0.9 m.) in the entrance. Above the basin the water flows for more than ½ mile up the Ob, an inlet which dries 6 feet (1.8 m.) at low water.

**Kyleakin village**, westward of the Lump on a flat peninsula, is a row of houses, mostly built of gray stone, standing a short distance back from the beach, with two churches and a post and telegraph office.

Close to the beach is the King's Arms Hotel, a long, whitewashed building; a short distance eastward of it is a well-built wooden pier, 27 feet broad, extending 75 yards from the shore, with a depth of 12 feet (3.7 m.) at low water alongside its outer end.

There is but little trade here except that arising from an uncertain herring fishery and from the calling of the steamers on their way north and south.

**Water.**—There is a supply of water at Kyleakin village, with several standpipes, from a reservoir, and water may be obtained in any quantity and conveniently from the burn at the head of Loch na Beiste, as well as from Allt Anavig, a stream about 670 yards westward of Doctor Rock, or from Kyle of Lochalsh Pier.

**Repairs** of a small nature can be carried out by ordinary boat builders, but there is no material to be had. A vessel may be safely grounded on the beach near the hotel.

**Anchorage** may be obtained anywhere off the village of Kyleakin about 200 yards from the shore in from 6 to 7 fathoms (11 to 12.8 m.) sand, but small vessels go closer in so as to be more out of

the current, where the bottom is blue clay. Farther out the bottom is hard, but should a vessel drive she will bring up in good holding ground on either shore.

**Doctor Rock**, on the southern shore of the western entrance to the Kyle, about  $\frac{1}{2}$  mile westward of the Lump and southwestward of Eilean nan Gilleán, is a mound 102 feet (31.1 m.) high, with a precipitous cliff on its northern face, and covered with trees, the tops of which are 133 feet (40.5 m.) above high water. Kyle House, a two-storied dwelling, with stables close southwestward of it which have the appearance of a small chapel but are almost hidden by trees, stands a little within Doctor Rock.

**The southern shore** of the western approach to Kyle Akin from Doctor Rock trends westward for 1.7 miles to a point terminating in Sgeir Iasgaich, a rocky peninsula 21 feet (6.4 m.) high, connected to the mainland by a low neck of shingle, and it is backed by hills 100 feet (30.5 m.) high immediately inland. Rocks above and below water extend 200 yards northward and westward from Sgeir Iasgaich.

**Bank.**—A bank with less than 5 fathoms (9.1 m.) water extends off this shore to a point  $290^\circ$ ,  $\frac{3}{4}$  mile from Kyle Akin Lighthouse; on or a little eastward of it are several shoal heads of  $1\frac{3}{4}$  to  $2\frac{3}{4}$  fathoms (3.2 to 5 m.), as well as the following rocks:

**Black Eye Rock** is a small patch, with 2 fathoms (3.7 m.) water and  $5\frac{1}{2}$  to 7 fathoms (10.1 to 12.8 m.) around, situated with Kyle Akin Lighthouse bearing  $91^\circ$ , distant 800 yards.

**Light Buoy.**—A can-shaped light buoy, painted black, exhibiting a group flashing white light, is moored 50 yards northeastward of the rock.

Eileanan Dubha, shut in behind Kyle Akin Lighthouse, leads northward, and the valley of Allt Anavig bearing  $178^\circ$  leads eastward of the rock. At night the southern limit of the white sector of Kyle Akin Light leads close northward of it.

**Bow Rock**, which dries 4 feet (1.2 m.), lies with Kyle Akin Lighthouse bearing  $81^\circ$ , distant 1,300 yards.

**Buoy.**—A black can buoy is moored immediately northward of a  $2\frac{1}{4}$ -fathom (4.1 m.) patch situated 350 yards northward of Bow Rock.

Castle Maol, bearing  $101^\circ$ , and twice its own breadth open of Doctor Rock, leads over the bank northward of Bow Rock, and between it and a  $1\frac{3}{4}$ -fathom (3.2 m.) patch in a least depth of  $3\frac{1}{2}$  fathoms (6.4 m.) but close southward of a  $2\frac{1}{4}$ -fathom (4.1 m.) shoal, lying 550 yards west-northwestward of Bow Rock. This mark is only of use for small vessels; those of deep draft should pass northward of the bank.

**Sassanach Reef** ( $57^{\circ} 16' \text{ N.}$ ,  $5^{\circ} 47' \text{ W.}$ ), 1,400 yards westward of Bow Rock, is several detached rocks; the outer rock dries 3 feet (0.9 m.) and lies with Kyle Akin Lighthouse bearing  $79^{\circ}$ , distant  $1\frac{1}{3}$  miles, and nearly 500 yards off Ardglass Point. The water is moderately bold on its northern side. The inner rocks lie from 200 to 350 yards southward and southeastward of the outer rock and dry 8 and 2 feet (2.4 and 0.6 m.).

Castle Maol, bearing  $101^{\circ}$ , twice its breadth, open of Doctor Rock, leads 600 yards northward of Sassanach Reef, and the eastern extremity of Crowlin More in range with Ru na Lachan leads westward of it.

At night the red sector of Kyle Akin Light covers both Bow Rock and Sassanach Reef.

The general depths in the channel eastward of the bank are from 9 to 6 fathoms (16.6 to 11 m.), but there are depths of about  $5\frac{1}{2}$  fathoms (10.1 m.) 300 yards westward from the lighthouse.

**Tides and tidal currents.**—It is high water, full and change, at Kyle Akin at 6h. 16m.; springs rise  $15\frac{1}{2}$  feet, neaps 11 feet, neaps range 7 feet.

The currents in Kyle Akin are somewhat irregular. During springs the current runs to the eastward from about 3 hours before until  $1\frac{1}{2}$  or 1 hour before high water. The north-going current is then running in Kyle Rhea, and the two currents meet near Eileanan Dubha. The current in Kyle Akin then sets westward from 1 hour before until high water, at which time the north-going current in Kyle Rhea ceases. The current in Kyle Akin again sets eastward from high water until 4 hours after high water, during which time the tide is falling and the south-going current is running through Kyle Rhea. From 4 hours after high water until 3 hours before the next high water the current runs westward through Kyle Akin, but in Kyle Rhea is running to the southward until low water, the currents separating near Eileanan Dubha. In Kyle Akin the rate of the currents does not exceed 2 knots in the narrowest part, but a strong northerly wind accelerates the east-going current.

During neap tides the current sets westward during the rising tide and eastward during the falling tide, with a greatest rate of 2 knots.

In Kyle Akin the rising tide is therefore due to the tidal undulation from the southward, but outside the Kyle it is due to the undulation from the northward.

**Directions.**—From the eastward pass through Kyle Akin ( $57^{\circ} 17' \text{ N.}$ ,  $5^{\circ} 43' \text{ W.}$ ) in mid-channel, leaving String Rock buoy on the port hand and Eileanan Dubha on the starboard hand; or pass northward of Eileanan Dubha with Balmacara Hotel just

open southward of Ru Doire na Earba  $84^{\circ}$ . Pass midway between Eilean nan Gillean and Doctor Rock, and from about 200 yards southwestward of the lighthouse steer about  $305^{\circ}$  until in deep water with Dubha Aird opening northwestward of Eileanan a Cru, about  $38^{\circ}$ . Castle Maol in range with Kyle Akin Lighthouse  $113^{\circ}$ , leads 150 yards northeastward of the 5-fathom (9.1 m.) edge of the bank extending off the shore westward of Doctor Rock.

At night in a vessel of moderate draft approach the eastern entrance to the Kyle in the white sector of Kyle Akin Light keeping when near String Rock on its northern edge. When northward of the Lump steer to pass 150 yards southwestward of the light; then steer about  $305^{\circ}$  into its white sector, and keep the same course in that sector, to clear the northeastern part of the bank extending off the southern shore, until in a depth of over 20 fathoms (36.6 m.).

When working through from the westward—which a smart cutter or schooner of 150 tons can do with a weather or slack current—observe caution in standing toward Doctor Rock at high water and toward the lighthouse and southern point of Eilean nan Gillean, within which there is more room. If the tidal current is too strong, anchor off the western entrance in 6 to 7 fathoms (11 to 12.8 m.), 400 yards  $285^{\circ}$  from the lighthouse to await its slackening. Give a sufficient berth to the shoals on the southern side between the Lump and String Rock.

**The coast** of the mainland, or the eastern shore of Inner Sound, from the Plock of Kyle trends northward  $1\frac{1}{4}$  miles to Portnacloiche Point. It is intersected by small bays and flanked by islands and rocks. Several villages stand on or near the shore, which is closely skirted by the Kyle of Lochalsh and Dingwall Railway.

The outer outlying rock is situated 900 yards  $4^{\circ}$  from Bleat Island; it dries 13 feet (4 m.) and is therefore only covered at high spring tides.

**Loch Carron.**—The entrance is between Portnacloiche Point and Rudha na h Uamha,  $3\frac{1}{4}$  miles to the northwestward; and the loch trends northeastward about  $4\frac{1}{2}$  miles to a bold promontory  $13\frac{1}{4}$  miles wide on its western face, of which Ru na Reraig ( $57^{\circ} 21' N.$ ,  $5^{\circ} 36' W.$ ) is the southern and the Meall na h'Aird the northern head; Loch Carron continues east-northeastward and northeastward about 7 miles on the southern side of the promontory and Loch Kishorn trends northeastward about 2 miles on its northern side.

The approach to the narrows of Loch Carron, about 3 miles within the entrance, becomes much encumbered by islets, rocks, and shoals, and the narrows  $\frac{1}{2}$  mile westward of Strome ferry is only 450 yards wide; the loch within, however, gradually opens out and

its upper part has an average width of nearly 1 mile. It has two good anchorages and two villages—Plockton, 4 miles within the entrance, and Lochcarron, near the head on the northern side. The Kyle of Lochalsh and Dingwall Railway runs close along the southern shore, and on the opposite side, also skirting the shore, is the highroad from Dingwall through Lochcarron to Stromeferry.

**Depths.**—The depth of water in Loch Carron is from 60 fathoms (109.7 m.) in the entrance to between 35 and 50 fathoms (64 to 91.4 m.) 3 miles within; it then shoals and becomes very irregular amongst the rocky islets and shoals before alluded to. In the loch, above Stromeferry, the depth increases again to from 40 to 60 fathoms (73.2 to 109.7 m.) for about 2 miles, and then gradually decreases toward the head, where an extensive flat dries out for upward of 1 mile, with very shallow water extending  $\frac{1}{2}$  mile farther and then dropping suddenly into depths of 8, 10 (14.6, 18.3 m.), and upward of 20 fathoms (36.6 m.).

**Pilots.**—There are no regular pilots in Loch Carron, but at Kyleakin, vessels from the southward can obtain a fisherman acquainted with the loch, and vessels from the northward can obtain one from the cottages on the eastern side of Crowlin More. For the upper part of the loch similar assistance can generally be obtained at Plockton.

**Loch Carron—Southern shore.**—The shore from Portnacloiche Point trends northeastward 2.6 miles to Dubh Aird. It is bordered by rocks and the islets Eilean a Cru, which are connected to it at low water, for 1 mile from Portnacloiche Point; it then becomes steep to to the entrance to Bagh Shrathie.

**Bagh Shrathie**, a deep indent in the shore southwestward of Dubh Aird, is frequented in a good fishing season by small vessels; the water is shallow, from 1 to 2 fathoms (1.8 to 2.7 m.), but the anchorage is well sheltered by several small islands, and the holding ground is good.

Eilean Dhub Dhurinish and Sgeir Bhuidhe are two noticeable islets on the western side of the entrance to Bagh Shrathie; the former is 21 feet (6.4 m.), the latter 19 feet (5.8 m.) high.

**Dubh Aird** ( $57^{\circ} 21' N.$ ,  $5^{\circ} 41' W.$ ) is a dark heath-covered peninsula, 116 feet (35.4 m.) high, rising steeply on all sides.

The shore eastward of Dubh Aird forms a bight in the eastern part of which are many islets and rocks; Sgeir nan Skarav, the northwestern cluster, one of which dries 16 feet (4.9 m.), is situated  $55^{\circ}$ , distant 1,100 yards from Dubh Aird.

**Rocks.**—A bank with  $6\frac{1}{2}$  fathoms (11.9 m.) of water lies 600 yards  $325^{\circ}$  from Dubh Aird, and a rock with  $4\frac{1}{2}$  fathoms (8.2 m.) water lies 900 yards  $28^{\circ}$  from the same point.

There are two rocky heads of  $3\frac{1}{4}$  and  $3\frac{3}{4}$  fathoms (5.9 and 6.9 m.) close together 300 yards northward from the western rock of Sgeir nan Skarav, and a patch of 5 fathoms (9.1 m.) lies 100 yards farther northwestward.

**Clearing mark.**—Cnoc Achmore, 933 feet (284.4 m.) high, open northward of the tower on Eilean a Chait, bearing southward of  $93^\circ$ , leads northward of the shoals between Dubh Aird and the Cat Islands.

**Rudha More** is the eastern point of a hilly peninsula on the eastern side of the bight above mentioned, and is situated  $1\frac{1}{2}$  miles eastward of Dubh Aird.

A chain of small islands lies close off the northern side of this peninsula, with which the two eastern islands are connected at low water.

**Cat Islands** are two islets situated northward of the chain of islands lying close off Rudha More.

Eilean a Chait, the eastern islet, is 24 feet (7.3 m.) high, and at low-water springs is connected by a sand spit with Eilean an Duine, the eastern of the islands off Rudha More.

On its northern point is a disused light tower 35 feet (10.7 m.) high and conspicuous.

Eilean a Bhata, the western islet, is 8 feet (2.7 m.) high and lies about 200 yards westward of the tower on Eilean a Chait.

A reef which dries 4 feet (1.2 m.) lies 300 yards westward of Eilean a Bhata, and there is a depth of 3 fathoms (5.5 m.) 200 yards westward of that reef.

The bank on which Cat Islands stand extends within the 3-fathom (5.5 m.) curve to a distance of 300 yards northward of Eilean a Bhata.

**Hawk Rock**, with 3 feet (0.9 m.) water, lies  $85^\circ$ , distant 200 yards from the tower on Eilean a Chait.

**Buoy.**—A red conical buoy is moored 50 yards northward of Hawk Rock, but it can not be depended upon.

**Shoal.**—About 400 yards east-northeastward of Rudha More, between that point and Bogha Dubh Sgeir, are two rocky heads of 2 and 3 fathoms (3.7 and 5.5 m.) 100 yards apart westward and eastward. There is a depth of  $4\frac{1}{4}$  fathoms (7.8 m.) between and for 150 yards northward of these rocks, with depths of from  $5\frac{1}{4}$  to 8 fathoms (9.6 to 14.6 m.) around the shoal.

**Leading mark.**—The High Stone of Sgeir Golach in range with Sgeir Buidhe, bearing  $330^\circ$ , leads close westward of this shoal and eastward of Hawk Rock.

**Sgeir Golach** ( $57^\circ 21' N.$ ,  $5^\circ 39' W.$ ), a cluster of rocks 400 yards in extent, lies about 400 yards northward of the Cat Islands.



The High Stone, the southeastern rock, only covers at very high spring tides, but it is not easily distinguished near high water; the western rock dries 12 feet (3.7 m.), and is marked by an iron pile beacon, surmounted by a cage, 9 feet (2.7 m.) high.

A rock, with  $2\frac{3}{4}$  fathoms (5 m.) water, lies  $287^\circ$ , distant 300 yards from the beacon.

The northern rock of the group dries 3 feet (0.9 m.), and the northeastern rock dries 10 feet (3.1 m.).

The northern side of Sgeir Golach is fairly steep-to, the 5-fathom (9.1 m.) curve being distant about 75 yards.

On the eastern side the 5-fathom (9.1 m.) curve is distant 300 yards from the rocks.

**Leading marks.**—The remarkable steep fall of the raised beach above Ardniaskin in range with the northern extremity of the land on the southern side of Strome Narrows, bearing  $95^\circ$ , 250 yards, leads northward of these rocks, and the eastern extremity of Sgeir Buidhe in range with the waterfall of the Yellow Burn on the northern shore of the loch, bearing  $319^\circ$ , leads eastward in 4 fathoms (7.3 m.) least water.

**Channel.**—There is a channel between Sgeir Golach and the Cat Islands with a depth of not less than 3 fathoms (5.5 m.) on the range.

**Range mark.**—Cnoc Achmore in range with the southern extremity of Strath Island, bearing  $96^\circ$ , leads through the channel between Sgeir Golach and the Cat Islands in a depth of not less than 3 fathoms (5.5 m.).

Should Cnoc Achmore be obscured, bring the beacon on Bogha Dubh Sgeir in range with the summit of the shoulder 390 feet (100.6 m.), at the end of Creag an Duislig, bearing  $106^\circ$ .

**Sgeir a Chinn**, the western of two islets, about 100 yards apart, situated  $\frac{3}{4}$  mile north-northwestward of Cat Islands, is 5 feet (1.5 m.) high, and foul ground extends south-southwestward 200 yards from it.

Two patches, 100 yards apart, with depths of  $4\frac{3}{4}$  and 5 fathoms (8.7 and 9.1 m.), lie 500 yards southwestward of Sgeir a Chinn.

The tower on Eilean a Chait in range with the tower of Duncraig Castle, bearing  $145^\circ$ , leads between these shoals and the foul ground off Sgeir a Chinn.

**Sgeir Buidhe** ( $57^\circ 22' N.$ ,  $5^\circ 39' W.$ ), the eastern of the two islets, is 14 feet (4.3 m.) high, and foul ground extends northward 150 yards from it.

**Rocks.**—A rock, with  $3\frac{1}{2}$  fathoms (6.4 m.) water and from 5 to 6 fathoms (9.1 to 11 m.) around, lies  $93^\circ$  220 yards from Sgeir Buidhe.

A rock with  $4\frac{1}{4}$  fathoms (7.8 m.) water and from 6 to 7 fathoms (11 to 12.8 m.) around lies  $315^\circ$  500 yards from Sgeir Buidhe.

Two rocks with depths of  $4\frac{3}{4}$  and 3 fathoms (8.7 and 5.5 m.) 520 and 840 yards, respectively, northward of Sgeir Buidhe.

**Clearing mark.**—Duncraig Castle open westward of Sgeir a Chinn,  $150^\circ$ , leads westward of the rocks northward of Sgeir Buidhe.

**Rock.**—A rock with  $1\frac{1}{2}$  fathoms (2.7 m.) water, on a bank about 200 yards in extent, lies  $750$  yards  $16^\circ$  from Sgeir Buidhe and 300 yards westward of Garra Islands.

The waterfall of Allt a Chumhaing in range with the western extremity of Kishorn Island, bearing  $351^\circ$ , leads close eastward, and Creag Darach in range with the High Stone of Sgeir Golach, bearing  $165^\circ$ , leads close westward, of this rock.

**Clach Beg** (Little Stone), 550 yards east-northeastward of Sgeir Buidhe, dries 3 feet (0.9 m.). Rudha na h Uamha open southward of Sgeir Buidhe,  $260^\circ$ , leads southward, and the waterfall of Allt a Chumhaing in range with the western extremity of Kishorn Island, bearing  $351^\circ$ , leads westward, of it.

**Ru na Reraig**, the southwestern part of the promontory dividing Lochs Carron and Kishorn, and a spur of Bad a Chreamha, is 506 feet (154.2 m.) high, and its sides are covered with wood; the coast of the promontory rises to the height of about 84 feet (25.6 m.) in remarkable terraces. Loch Reraig, between Ru na Reraig and the Aird, the northwestern part of the promontory, is a bay on the northern side of which is Reraig Peak, bare, and 400 feet (121.9 m.) high. Between Ru na Reraig and the southern shore are the narrows of Loch Carron, with the Strath Islands occupying a central position.

**Eilean na Ben** ( $57^\circ 22' N.$ ,  $5^\circ 37' W.$ ), a bare rock of pale colored stone 40 feet (12.2 m.) high, lies 200 yards from Rudha Thollaidh, the western point of Ru na Reraig. Douglas Rock, with 6 feet (1.8 m.) water, lies  $240^\circ$  400 yards from the islet, and a detached patch of  $4\frac{3}{4}$  fathoms (8.7 m.) lies  $260^\circ$  450 yards from the islet. A bank, with general depths of from 2 to  $2\frac{1}{2}$  fathoms (3.7 to 4.6 m.) extends southward of a line from Douglas Rock, through Eilean na Ben, to Rudha Thollaidh toward the Strath Islands.

**Strath Islands** are several small islets which from the westward appear as one; the largest is 29 feet (8.8 m.) high. The bank on which these islands stand is connected with Ru na Reraig, and extends 1,650 yards westward from Eilean Glasaich, the western islet of the group, to Bogha Dubh Sgeir.

**Strome Islands** lie immediately northeastward of Strath Islands and on the same bank; between them and Ardaniaskin there are depths of 5 to 6 feet (1.5 to 1.9 m.).

**Sgeir na Olloch**, 450 yards southwestward of Eilean Glasaich, dries 13 feet (4 m.) and is generally above water; shallow water extends from south-southeastward 350 yards from it.

**An Dubh Sgeir**, 500 yards west-northwestward of Sgeir na Olloch, is a flat rock 3 feet (0.9 m.) high; it is surrounded by a fringe of low-water rocks, and there are several rocks west-northwestward and eastward of it, of which one lying nearly 200 yards to the east-northeastward dries 2 feet (0.6 m.).

**Bogha Dubh Sgeir**, situated at the western extremity of the bank, dries 3 feet (0.9 m.), and is marked by an iron pile beacon 10 feet (3.1 m.) high surmounted by a cage.

**Shoal**.—A patch of  $4\frac{1}{4}$  fathoms (7.8 m.) lies nearly 200 yards west-southwestward of the beacon.

**Leading mark**.—The waterfall of the Yellow Burn in range with the eastern extremity of Sgeir Buidhe,  $319^\circ$ , leads nearly 200 yards westward of Bogha Dubh Sgeir and close westward of the  $4\frac{1}{4}$ -fathom (7.8 m.) patch.

**Birch Rock** ( $57^\circ 21' N.$ ,  $5^\circ 37' W.$ ), 550 yards southwestward of An Dubh Sgeir, has a depth of 6 feet (1.8 m.) water.

**Leading marks**.—The extremity of Matheson Point in range with the south shoulder of Cnoc Achmore, bearing  $95^\circ$ , leads 70 yards northwestward of Birch Rock, and the middle of Yellow Cliff Island in range with the station master's house, the southern of the two houses in the gap between Creag na Cairge and the hills behind Plockton, bearing  $246^\circ$ , leads southward of it.

The waterfall of the Yellow Burn in range with the eastern extremity of Sgeir Buidhe, bearing  $319^\circ$ , leads westward.

**Yellow Cliff Island**, 16 feet (4.9 m.) high, with some trees on it, is situated about 600 yards south-southeastward of Rudha More.

A rock, which dries 8 feet (2.4 m.), and is marked by an iron spindle, lies about 100 yards south-southeastward of Yellow Cliff Island.

**Plockton Rocks** are two rocks situated about 200 yards northward of Yellow Cliff Island; the northern of these dries  $6\frac{1}{2}$  feet (2 m.) and the southern rock dries 8 feet (2.4 m.); both are marked by iron spindle beacons.

**Anchorage**.—There is good shelter and holding ground in 6 fathoms (11 m.) water eastward of Rudha More and about 250 yards northward of Plockton Rocks beacon.

A rock which dries 3 feet (0.9 m.) lies nearly midway between the southern Plockton Rock and Yellow Cliff Island.

**Plockton Harbor**, a bight southwestward of Yellow Cliff Island, is an excellent place for small vessels, which can anchor in about 2 fathoms (3.7 m.) water, with clay bottom. A vessel can be placed on the beach near the village where it is flat and free from rocks.

Plockton village consists of a street of stone-built houses nearly  $\frac{1}{2}$  mile long, with a cluster of huts on Ard Vourar, a point projecting from the northern side of the harbor; it contained 295 inhabitants in 1911.

The village has two churches and a schoolhouse, with a few shops, a post and telegraph office, and an inn.

The railroad station is about  $\frac{1}{2}$  mile from the village.

**Water.**—A good supply of water is led through pipes from Loch Lundie to the beach.

**Supplies** are scarce, but can be obtained in large quantities from Inverness by arrangement.

**Creag na Cairge.**—The hills to the westward of Plockton rise to a height of 200 feet (61 m.); the lower slopes are cultivated in patches and separated from the higher hills to the southward by a gap through which the railroad and high road pass.

Creag na Cairge, a steep-faced wooded hill, 466 feet (142 m.) high, is situated on the southern side of this gap.

**Duncraig Castle** ( $57^{\circ} 20' N.$ ,  $5^{\circ} 38' W.$ ) is a stone building standing in well-wooded grounds near the shore to the southward of Yellow Cliff Island.

The Dingwall and Kyle of Lochalsh Railway runs along the shore under the castle.

**Creag Darach**, a hill 1,300 yards southward of Duncraig Castle, is 844 feet (257.2 m.) high and conspicuous.

**Tides.**—It is high water, full and change, at Plockton at 6h. 29m.; springs rise  $16\frac{1}{2}$  feet, neaps  $11\frac{1}{2}$  feet; neaps range 7 feet. Spring tides occurring at or about the time of moon's perigee rise 17 feet and range 19 feet; the level of low water is then from 1 to  $2\frac{1}{4}$  feet below that of ordinary springs.

**Eilean na Creige Duibhe**, an islet, 80 feet (24.4 m.) high, is about 200 yards offshore  $\frac{1}{2}$  mile east-northeastward of Duncraig Castle.

**Ulluva**, 350 yards offshore, 350 yards north-northeastward of Eilean na Creige Duibhe, is a flat bare rock on the southern edge of the deep-water channel; foul ground extends 300 yards westward from it.

**Beacon.**—A rough stone beacon, 15 feet (4.6 m.) high, stands on the northern point of Ulluva; it is not conspicuous from the northward.

**Rock.**—A rock, awash at low water springs, lies 100 yards northward of Ulluva, and close to the edge of the bank on which Ulluva stands.

**Aspect.**—About 2 miles eastward of Plockton the character of the shore alters from rock to alluvial deposit. Creag an Duislig, a

range of basaltic cliffs 1,146 feet (349.3 m.) high, which rises above the shore between Eilean na Creige Duibhe and Matheson Point, curves to the southeastward, and between it and Hulin Hill is Strath Ascaig, a deep valley.

The railroad crosses the entrance to this valley on an embankment.

A remarkable raised beach commences on the eastern side of Strath Ascaig and fronts the hills for about a mile, rising to a height of from 80 to 100 feet (24.4 to 30.5 m.), with a narrow strip of flat stony land at its base only a few feet high.

The railroad runs along this strip, the raised beach being cut away where necessary.

**Port a Chuilinn**,  $1\frac{1}{4}$  miles northeastward of Ulluva, is a small fishing village, with a few huts at the foot of the raised beach. Hulin Hill (Creag Mhaol), about 400 yards southeastward of the village, is 649 (197.8 m.) high and in places very steep.

**Cnoc Achmore** ( $57^{\circ} 21' N.$ ,  $5^{\circ} 33' W.$ ), situated about 1 mile east-southeastward of Hulin Hill, is a sharp-pointed peak, 933 f et (284.4 m.) high, and the highest of the hills immediately southward of Strome ferry: Bad a Chreamha, 1,289 feet (392.9 m.) high, is on the northern shore of Strome Narrows.

**Strome Narrows—Rocks.**—A shoal spit extends 350 yards from the southern shore at the western entrance to Strome Narrows immediately eastward of Port a Chuilinn; vessels passing this spit should keep close to the northern shore, which can be approached to the distance of 100 yards.

A rock, with 2 fathoms (3.7 m.) water, lies near the middle of the narrows, and 250 yards west-southwestward of Eilean an Fhraoich, on the southern side of Castle Bay.

A shoal of  $3\frac{1}{4}$  fathoms (5.9 m.) is situated about 35 yards southwestward of this rock.

**Leading mark.**—The western end of the railroad pier in range with the eastern Strome Railway signal, bearing  $110^{\circ}$  leads southwestward of these rocks.

**Stromeferry** lies on the southern side of Loch Carron at the eastern end of Strome Narrows; there is a station of the Dingwall and Skye Railway at the village.

A wooden pier extends 75 yards from the shore and has a T head of about the same length, with a depth of 10 feet (3.1 m.) at low-water springs alongside it. The pier is now disused.

Immediately westward of the pier is a stone slipway for the ferryboat, which plies across the narrows.

There is an inn on each side of the ferry, and the ruins of Strome Castle, an ancient stronghold, are near the north ferry inn.

**Anchorage.**—There is good shelter from the westward and southward off Stromeferry on the bank extending eastward from the pier. The holding ground is good and the tidal currents weak.

**Tides.**—The time of high water and range of tide at Stromeferry is the same as at Plockton.

**The loch** above Stromeferry is clear of shoals and generally deep until near the head.

**Ardnarff Bay**, on the southern shore of the loch  $1\frac{1}{4}$  miles above Stromeferry, affords temporary anchorage in about 6 fathoms (11 m.) close to the low-water shore, but the water deepens rapidly, and a vessel might be driven off the bank. This is the only anchorage on the southern shore.

**Slumbay**,  $2\frac{1}{2}$  miles above the ferry and on the northern shore to which it is connected, protects Slumbay Harbor on its northern side. In this harbor small craft anchor in from  $1\frac{1}{2}$  to 2 fathoms (2.7 to 3.7 m.); there is a pier, dry at low water, off the village on its western side.

**Sgeir Chreagach and Sgeir Fhada** lie in the middle of the loch above Slumbay, and on an extensive shallow bank extending round the head of the loch, but there is deep water on their south-eastern sides; some rocks and shoals lie around these islands. Abreast of Sgeir Fhada on the northern shore is the village of Lochcarron ( $57^{\circ} 24' N.$ ,  $5^{\circ} 29' W.$ ), which had 1,066 inhabitants in 1921, and there is a pier and an inn near its eastern end; vessels anchor off the village in from  $2\frac{1}{2}$  to 3 fathoms (4.6 to 5.5 m.).

The loch above Stromeferry is very little visited by shipping; the chart is a good guide for this part of the loch, but mariners should obtain a pilot at Plockton.

**Loch Carron entrance—Northern shore—Rudha na h Uamha**, the northwestern entrance point of Loch Carron, is a steep bold point terminating in cliff, and from it the shore trends eastward  $6\frac{1}{2}$  miles to the head of Loch Kishorn.

The land at the back is sterile and mountainous, commencing near Rudha na h Uamha with rugged hills from 800 to 1,000 feet (243.8 to 304.8 m.) high, increasing in height and barrenness until reaching Sgor na Caorach, which attains a height of 2,531 feet (771.4 m.), about  $1\frac{1}{2}$  miles northward of Loch Kishorn. It is across these mountains that the highest road in Great Britain is carried, by which the district of Applecross is reached. The whole of this shore is steep-to.

**Ardrisaig**, about  $2\frac{3}{4}$  miles from Rudha na h Uamha, is the first cultivated land on this sterile shore; it lies on a slope, with one or two white cottages on it, which though steep is flatter than the adjacent land, and there is a deep burn immediately to the westward; the shore is skirted by a belt of wood. At all seasons the bright green

and yellowish tints here contrast with the somber appearance of the adjacent country.

**Yellow Burn** (Allt a Chois) is  $1\frac{1}{4}$  miles eastward of Ardrisaig, and 300 yards inland is a waterfall, 238 feet (72.5 m.) high, having a steep brow on its western side, and the mountains of Meall Gorm sloping down to it on the east; it is the first burn eastward of Ardrisaig that shows at all prominently.

**Allt a Chumhaing**, 1.1 miles eastward of Yellow Burn, is a burn with a waterfall, 250 feet (76.2 m.) high,  $\frac{1}{4}$  mile within its entrance.

**Loch Kishorn**, on the northern side of the steep wooded promontory, of which the Meall na h' Aird, 598 feet (182.3 m.) high, is the northwestern part, is 2 miles deep and nearly 1 mile wide, and is an excellent port of refuge for vessels of any size. Rocks dry off about 800 yards from the head of the loch, but there are no shoals in its approach; the holding ground is good, and no swell comes home; the most dangerous winds are from the northwest. The water shoals gradually from about 35 fathoms (64 m.) in the entrance to 10 and 6 fathoms (18.3 to 11 m.) about  $\frac{1}{2}$  mile from the head. The northern shore is foul and rocky in places to the distance of over 200 yards; it affords bad landing.

**Kishorn River** falls into the northern part of the head of the loch, and a rocky spit, which uncovers, and has a rock 2 feet (0.6 m.) high near its outer end, extends 250 yards from Fools Point, the eastern entrance point. Shoal water extends off the mouth of the river to a line drawn westward from off the end of this spit.

**Shoals.**—A shoal, with  $4\frac{3}{4}$  fathoms (8.7 m.) water, and from 7 to 8 fathoms (12.8 to 14.6 m.) around, lies with Fools Point bearing  $350^\circ$ , distant 500 yards; and a shoal of  $5\frac{1}{4}$  fathoms (9.6 m.) lies 150 yards farther westward.

A bank of 8 fathoms (14.6 m.) lies in mid-channel with Fools Point, bearing  $30^\circ$ , distant 1,600 yards.

**Achintraid Village** is situated on the shore at the southern part of the head of the loch; flats with several rocks which dry extend 800 yards west-southwestward of this village.

**Sgor a Brideoin More**, the western of these rocks, dries 10 feet (3.1 m.) and is marked by a notice board.

A bank extends westward and southward of this rock; its outer edge, with  $3\frac{1}{4}$  fathoms (5.9 m.) water, is distant 400 yards to the westward.

**Garra Islands** (An Garbh Eilean) are a cluster of islands and rocks lying westward of the Meall na h' Aird. There is no passage, except for boats, eastward of them, but they are fairly steep-to on their western and northern sides. Kishorn ( $57^\circ 23' N.$ ,  $5^\circ 39' W.$ ), the northern and largest island, has a lump or peak 62 feet (18.9 m.) high near its western side.

There is a narrow passage with  $3\frac{1}{4}$  fathoms (5.9 m.) water between Kishorn Island and the southern Garra Islands; but it is not recommended, as no leading mark can be given.

**Anchorage.**—The head of Loch Kishorn and its southern side are available for anchorage, and small vessels can also anchor between Kishorn Island and the Meall na h' Aird.

**Tidal currents.**—The tidal currents in Loch Carron are weak until near Strome Narrows, where the rate is from 2 to 3 knots at springs. The currents run into the loch and through the narrows with the rising tide and out with the falling tide. The in-going current through the narrows sets toward the northern shore and the out-going toward the southern shore. The currents in Loch Kishorn are weak.

**Directions.**—In entering Loch Carron steer for a position about  $\frac{3}{4}$  mile northward of Dubh Aird and then proceed eastward, with the northern extremity of the land on the southern side of Strome Narrows a little open south-southeastward of the raised beach at Ardaniaskin  $92^\circ$  until Sgeir Buidhe bears  $50^\circ$ ; then edge to the northward and keep the above-mentioned extremity of the land in range with the raised beach  $95^\circ$  until the waterfall at Yellow Burn is in range with the eastern extremity of Sgeir Buidhe  $319^\circ$  views on plan. This mark astern leads 150 yards eastward of Sgeir Golach and 200 yards westward of Bogha Dubh Sgeir in a least depth of 4 fathoms (7.3 m.), but deeper water can be obtained by bringing the waterfall open a little eastward of Sgeir Buidhe while passing Sgeir Golach, and in a vessel of much draft the waterfall should be just shut in by Sgeir Buidhe while passing Bogha Dubh Sgeir to give a sufficient berth to the  $4\frac{1}{4}$ -fathom (7.8 m.) patch westward of it.

When the southern shoulder of Cnoc Achmore ( $57^\circ 21' N.$ ,  $5^\circ 33' W.$ ) is in range with Matheson Point  $95^\circ$ , view on plan, keep this mark on until the station master's house is in range with Ulluva Beacon  $252^\circ$ . Pass southward of the shoals southward of Strath Islands with the last mark on astern, and when the highest point of Creag Darach is in range with the eastern end of the cutting through the point eastward of Eilean na Creige Duibhe  $222^\circ$ , view on chart, astern, keep it on through the channel between Strath Islands and the southern shore. When Strome Island is in range with the gap between Creag na Cairge and the hills behind Plockton  $245^\circ$  and the pierhead of Stromeferry opens northward of the southern side of the narrows keep 200 yards from the northern shore.

With the in-going current caution is necessary to avoid approaching the northern shore of the narrows too closely, and with the out-going current, which sets over the spit eastward of Port a Chuillin, keep close to the northern shore until Port a Chuillin bears about



160°. After passing the narrows proceed in mid-channel up the loch as far as Lochcarron, but a stranger should take a pilot off Plockton.

Small vessels, with southwesterly winds, may pass southward of Sgeir Golach, with Cnoc Achmore in range with the southern extremity of Strat Island, until the High Stone of Golach is in range with Sgeir Buidhe, 330°, which mark leads southward until Plockton Church is in range with the southeastern houses, when enter the harbor and anchor in from  $1\frac{3}{4}$  to  $2\frac{1}{4}$  fathoms (3.2 to 4.1 m.).

Working between Sgeir Buidhe and Sgeir Golach, when the latter rocks are covered, observe great caution in standing to the southward until the Yellow Burn is open eastward of Sgeir Buidhe; afterwards, in standing to the northward to clear Clach Beg, keep the land about Rudha na h Uamha open of Sgeir Buidhe.

In entering Loch Kishorn give the northern shore a berth of 350 yards and anchor as above directed, using the chart as a guide. Vessels of much draft should approach the head of the loch with caution.

**Inner Sound.**—Northward of Rudha na h Uamha, the Isle of Skye is separated from the mainland of Ross by an almost uniform distance of 9 miles; this otherwise broad area is, however, divided into two by South Rona and Raasay, which extend northward through it for a distance of  $15\frac{1}{2}$  miles. The southern end of Raasay closely approaches Skye, while the northern end of South Rona is about 5 miles from Skye and  $3\frac{1}{2}$  miles from the mainland near the entrance to Loch Torridon.

The Inner Sound is the passage on the eastern side of the islands from Kyle Akin to the open water to the northward, Raasay Sound being that westward of the islands. The narrowest part of the Inner Sound, between Crowlin Islands and the islets eastward of Scalpay, is also known as Linne Crowlin.

The southern part of the Inner Sound is considerably obstructed by the many islands and shoals lying well off both shores, so that in the Linne Crowlin it is scarcely 2 miles wide, but northward of the Crowlin Islands both shores are clear of shoals, and the sound is from  $5\frac{1}{2}$  to 3 miles wide, the narrowest part being toward the northern entrance. The depth of water is great, there being in many places over 100 fathoms (182.9 m.) and in some nearly 140 fathoms (256 m.).

**Inner Sound—East shore.**—The shore from Rudha na h Uamha ( $57^{\circ} 21' N.$ ,  $5^{\circ} 47' W.$ ), on the northern side of the entrance to Loch Carron, trends north-northwestward about 6 miles, and thence northward about 8 miles to Rudha na Fearnna, on the southern side of the entrance to Loch Torridon. The southern portion is much broken by bays and indentations, the northern part being compara-

tively regular; but in no part are there any shoals more than 600 yards from the shore, and generally it is steep-to.

**Crowlin Islands**, situated 1 mile westward of Rudha na h Uamha, are three islands connected with each other at low water. Crowlin More, the southeastern and largest island, is  $1\frac{1}{4}$  miles long, north and south, about 1,200 yards broad, and 367 feet (111.9 m.) high, the eastern and southern sides being steep-to, with rocks drying off in a few places about 100 yards. Crowlin More is badly supplied with water, which is very scarce during a dry summer. Several families live on the island.

Crowlin Meadhonach, long and narrow, runs parallel with the western side of Crowlin More, leaving a narrow pass between which dries in places at low water, but has 2 fathoms (3.7 m.) water in others. Here herring boats occasionally find shelter. Rocks dry off 250 yards from the southern end of the island.

Crowlin Beg, 200 yards northward of Crowlin Meadhonach and connected to it by a rocky ledge, is about 700 yards long northward and southward, and 500 yards broad; several detached rocks extend north-northeastward  $\frac{1}{4}$  mile from the island, the outer one drying 2 feet (0.6 m.).

The channel between Crowlin More and Crowlin Meadhonach open leads eastward; Coilegille Village open northward of Cow Island,  $55^\circ$ , leads northward; and the Free Church and manse,  $\frac{1}{2}$  mile south-southeastward of Camusteel, open northward of Aird-ban,  $32^\circ$ , leads northwestward of the rocks northeastward of Crowlin Beg.

**Light**.—A flashing white light, 105 feet (32 m.) above water, visible 14 miles, is shown from a white beacon, 16 feet (4.9 m.) high, on Crowlin Beg.

**The channel** between the rocks off the Crowlin Islands and those off the mainland and Cow Island is about 1,200 yards wide, deep and clear.

**Tidal currents**.—Between the Crowlin Islands and the mainland the current runs southward during the rising, and northward during the falling tide; both currents have a rate of 1 knot at springs; but the currents here are greatly influenced by the currents setting into or out of, Loch Carron.

**Ru Toscaig** ( $57^\circ 22' N.$ ,  $5^\circ 49' W.$ ) lies 1.3 miles north-northwestward of Rudha na h Uamha; and nearly 200 yards off the point are two bare rocks from 10 to 20 feet (3.1 to 6.1 m.) high; 400 yards farther northward and 200 yards offshore is Sgeir Shalach, a rock which dries 14 feet (4.3 m.).

**Loch Toscaig**, on the eastern side of Ru Toscaig, extends northward nearly 1 mile and is 400 yards wide; the holding ground is

good and the water deep, but it is rather open to southwesterly winds. The best anchorage is well up the loch in about 10 fathoms (18.3 m.).

**Bo Du** lies 550 yards southeastward from Ru Toscaig in the entrance to Loch Toscaig, and dries 3 feet (0.9 m.). It is marked by a beacon which must not be depended on. The high part of Cow Island open westward of the rocks off Ru Toscaig leads westward of it.

**Cow Island** (Eilean na Ba), nearly 600 yards offshore 1 mile north-northwestward of Ru Toscaig, is about 500 yards long northward and southward, and 250 yards broad; there is a hillock, 72 feet (21.9 m.) high on its western end; low-water rocks extend 300 yards from the island except around its western point.

**Airdban** is a small promontory 1.9 miles northward of Ru Toscaig; Sgeir Mhaol, a reef, extends 400 yards offshore  $\frac{1}{2}$  mile southward of its northern end, and Sgeir More, a cluster of rocks which dry 9 feet (2.7 m.) extends 400 yards westward from its northern part.

The western rock of Sgeir More is marked by a beacon which must not be depended on.

**Saint Island** (Eilean nan Naomh).—At  $1\frac{1}{4}$  miles northward of Airdban is a point, on the eastern side of which is the small bay and village of Camusteel. Almost in a line between the two points is Saint Island, southward and eastward of which the land falls back, forming the inlets of Poll Doin and Poll Creadha, with many low-water rocks, but with sufficient water and space between them for small vessels to enter and find anchorage. Saint Island is little more than 200 yards in length northward and southward and is low and flat, with low-water rocks drying off 500 yards northward and southward of it, and for about 200 yards westward. A beacon stands on the southernmost of the rocks extending from the island, but it must not be depended on. Farther off the island the water deepens very quickly to 8 or 10 fathoms (14.6 to 18.3 m.), except on the inshore side, where the passage between the island and the inshore rocks has from 3 to  $5\frac{1}{2}$  fathoms (5.5 to 10.1 m.) water.

A rock, marked by a beacon, is situated in the channel nearly midway between Saint Island and Airdban.

Applecross Church just open of the land on the southern side of Applecross Bay,  $18^\circ$ , leads outside all shoal water off Airdban and Saint Island.

**Poll Doin** is on the eastern side of Airdban, and is easy of access. Ruag Eilean, two small islets on a reef, protect the entrance, and there is a passage on either side of them leading to an anchorage in 5 fathoms (9.1 m.) nearly 200 yards in width.

**Tides.**—It is high water, full and change, at Poll Doin, at 6h. 22m.; springs rise  $14\frac{3}{4}$  feet.

**Poll Creadha** ( $57^{\circ} 24' N.$ ,  $5^{\circ} 49' W.$ ), eastward of Ard Du, a peninsula within Saint Island, extends southward about 1,400 yards; the upper part, which is narrow; dries out over 600 yards at springs. Sgeir Goblach is a reef of rocks, greatly obstructing the entrance; both its northern and southern ends are marked by beacons, and there are three beacons on the inner rocks. Two beacons are also placed on the northern edge of the rocks extending from the southern entrance point. The beacons are not to be depended on. There are 2 fathoms (3.7 m.) water in the entrances, which lie on either side of Sgeir Goblach, and the anchorage is in from  $2\frac{1}{2}$  to 3 fathoms (4.6 to 5.5 m.), but the channels are too intricate for a stranger to enter.

**Applecross Bay**, 5 miles northward of the Crowlin Islands, is a wide open bay, unsuitable for anchorage. There are no outlying shoals, but the sand dries off  $\frac{1}{2}$  mile from the head of the bay, within which are the mansion house and church among trees. On the southern side of the bay are two small piers, the outer ends of which are marked by beacons, and a long row of cottages on the shore. A vessel may anchor temporarily in from 5 to 10 fathoms (9.1 to 18.3 m.) anywhere along the shore, but the outer pier should be given a berth of 200 yards.

**Little Rocks** lie nearly 400 yards offshore about 1 mile north-northwestward of Rudha na Guailne, the northern point of Applecross Bay, and dry 2 feet (0.6 m.). There is a channel with about 2 fathoms (3.7 m.) water inside them, but it is partly blocked by a low-water rock 100 yards from the shore. Ru na Lachan lies about 1,600 yards northward of Little Rocks, and on its southern side is an inlet which completely dries, and 300 yards outside the low-water line are three 2-fathom (3.7 m.) patches with deep water about  $\frac{1}{4}$  mile outside them.

**Ard na Claise More**, nearly 2 miles north-northwestward of Ru na Lachan, is a prominent part of the land, with the village of Lon Ban from 400 to 600 yards northward of it; a rock, awash at low water, lies 100 yards from the point.

The shore between Ru na Lachan and Rudha Chuaig, a distance of  $5\frac{1}{2}$  miles, is clear of off-lying shoals and generally there are depths of from 10 to 20 fathoms (18.3 to 36.6 m.) 600 yards off-shore.

About  $\frac{1}{2}$  mile southward of Rudha Chuaig and on the northern side of Grey Nose is Little Bay, a small bight with about 2 fathoms (3.7 m.) water; in the middle of the bay and just within a line connecting the two points is a rock dry at low water.

**Ob Chuaig** ( $57^{\circ} 34' \text{ N.}$ ,  $5^{\circ} 50' \text{ W.}$ ) extends about 1,200 yards southward between Rudha Chuaig and Rudha na Fearna. Eilean Chuaig, small rocky, and 24 feet (7.3 m.) high, lies in the entrance of the bay; it is steep-to on its western and southern sides, but about 150 yards north-northeastward of it is Peters Rock, which dries 4 feet (1.2 m.). The bay has from  $5\frac{1}{2}$  to 2 fathoms (10.1 to 3.7 m.) water, but a rock with 2 feet (0.6 m.) water lies 350 yards south-southeastward of the island, and Black Rock, which dries at low water, is in the middle of the bay near the head. The sands dry out about 200 yards from the head of the bay.

**Rudha na Fearna**, the southern entrance point of Loch Torridon, appears long, low, and sterile from the southwestward. There are several rocks off it; Murdoch Breac, the outer one, lies 600 yards northwestward of the point, and dries 3 feet (0.9 m.); midway between it and the shore is a rock which dries at low water, with an under-water rock close eastward of it, and 600 yards eastward from it is a shoal with 6 feet (1.8 m.) water. Ard na Claise More, open westward of Eilean Chuaig,  $190^{\circ}$ , leads about 200 yards westward of Murdoch Breac; and the white schoolhouse on the north shore of Loch Daibaig just open northward of Rudha na h Uamha,  $97^{\circ}$ , leads 300 yards northward of Murdoch Breac, but only 100 yards northward of the 6-foot (1.8 m.) shoal eastward of it.

**Inner Sound—South and west shores.**—The south shore of the Inner Sound from the entrance of Kyle Akin to and inclusive of Broadford Bay is the coast of Skye, and the west shore of the sound is the east coast of Scalpay, Raasay, and south Rona. From the entrance to Kyle Akin to and including Broadford Bay the shore is shallow, with a number of rocks, dry at low water.

The south shore of the sound from Sgeir Iasgaich trends westward 3 miles to Broadford Bay, and is backed by hills rising to a height of 100 feet (30.5 m.) immediately inland.

**Rudha Lusa**, 1 mile westward of Sgeir Iasgaich, is a flat, cultivated point at the eastern entrance to Abhuinn Lusa, a large stream; there are some conspicuous farm buildings on it.

Rocks, which uncover, fringe the point for a distance of 200 yards.

**Sgeir Dubh** ( $57^{\circ} 16' \text{ N.}$ ,  $5^{\circ} 50' \text{ W.}$ ), a rock 12 feet (3.7 m.) high, is situated 700 yards north-northwestward of Rudha Lusa, near the northern edge of the shoal water extending from the mouth of Abhuinn Lusa.

Rocks, which uncover, extend 150 yards northwestward and south-eastward from Sgeir Dubh.

**Anchorage.**—The shore between Sgeir Iasgaich and Sgeir Dubh can be safely approached, and anchorage can be obtained about 400

yards eastward of Sgeir Dubh, in from 6 to 8 fathoms (11 to 14.6 m.) water, good holding ground.

**Rudha Ardnish**, the northeastern point of the long, narrow Ardnish Peninsula, lies 1,800 yards west-southwestward of Rudha Lusa, the mouth of Ob Breakish, a considerable stream, lying between.

Reefs extend 600 yards east-northeastward and 300 yards north-northwestward from Rudha Ardnish.

**Eilean Rugach** is a small rock, 15 feet (4.6 m.) high, situated on the reef 300 yards northeastward of Rudha Ardnish.

The trap dikes, which extend from the shore and resemble massive jetties, are noticeable features in this vicinity.

**Paby**, an island 1 mile northward of Rudha Ardnish, is about  $\frac{3}{4}$  mile in diameter, formed of lias, and intersected with numerous trap dikes which appear like walls. The east and west coasts rise steeply to a height of 40 feet (12.2 m.) and then more gradually to a flat summit 82 feet (25 m.) high.

The island is covered with grass and used for pasturage; there are some farm buildings on its western side. The landing place is a concrete jetty at the southwestern extremity of the island, the outer end of which is marked by an iron perch.

The fossils and peculiar formation of the island are worth attention from the geologist.

Rocks dry at low water extend 600 yards northward from the north coast of the island; Castle Maol, twice its own breadth, open northward of Doctor Rock,  $101^\circ$ , leads 300 yards northeastward of the rocks in about 8 fathoms (14.6 m.) water. At night Kyle Akin Light, bearing  $105^\circ$ , leads 1,000 yards northward of the rocks, but the southern limit of the white sector of the light passes over their northern edge.

On the eastern side of the island the low-water line projects about 250 yards. Shoal water and rocky ledges extend 400 yards off the south coast of the island.

**Sgeir Ghobhlach** ( $57^\circ 16' \text{ N.}$ ,  $5^\circ 52' \text{ W.}$ ), near the southwestern extremity of the rocks extending from Paby, dries 6 feet (1.8 m.), and lies  $\frac{1}{2}$  mile south-southwestward from the southwestern point of the island.

**Beacon**.—An iron beacon painted red, with a cage at the top, 30 feet (9.1 m.) high, stands on the southern part of Sgeir Ghobhlach.

There is no passage at low water northward of Sgeir Ghobhlach except for boats, and shoals extend nearly 400 yards southwestward from the beacon, but the southern edge of the shoal is fairly steep. The eastern extremity of South Rona in range with the western side of Longay,  $353^\circ$ , leads westward of this and of all the rocks on the western side of Paby.

**Caolas Paby** ( $57^{\circ} 16' \text{ N.}$ ,  $5^{\circ} 51' \text{ W.}$ ), the passage southward of Paby, is 1 mile in width at high water, but the rocks extending from both sides reduce its navigable width between the 5-fathom (9.1 m.) curve to 450 yards.

**Shoals.**—A series of shoal ledges extend off the southern shore of the pass and lie southward of a line drawn  $235^{\circ}$  from a position with Eilean Rugach bearing  $180^{\circ}$ , distant 1,300 yards.

**Clearing mark.**—The hotel at Broadford in range with a summit on the southern slope of Ben Dearg Beg (a mountain one mile south-southwestward of Ben na Caillich), bearing  $236^{\circ}$  leads close northward of the shoals on the southern side of Caolas Paby.

**Caution.**—Caolas Paby should not be taken by vessels of heavy draft without either local knowledge or having previously marked the edge of the 5-fathom (9.1 m.) curve southward of Paby.

The difficulties arising from the shore on the southern side being low and fronted by many shoals are increased by the absence of a good leading mark.

**Tidal currents.**—In Caolas Paby the currents have a rate of half a knot at springs, setting eastward with the rising, and westward with the falling, tide.

**Broadford Bay**,  $1\frac{1}{2}$  miles south-southwestward from Paby, is about 1 mile wide at its entrance and 1,400 yards deep; its shores are fringed with low-water rocks to the distance of 300 yards, from which the water gradually deepens. The bay affords no shelter in northerly winds.

Bogha More Achadh a Chuirn,  $\frac{1}{4}$  mile northwestward of Rudh Achadh a Chuirn, the southeastern entrance point of the bay, dries 2 feet (0.6 m.).

Eilean Glas, 200 yards off the southern side of the bay, is 10 feet (3.1 m.) high, and rocks, which dry 5 feet (1.5 m.) extend 200 yards northward of it.

**Broadford Village**, on the southwestern side of the bay and near the mouth of Broadford River, is a few houses; there are numerous cottages on the shore of the bay and along the road to Kyleakin. The hotel at Broadford is conspicuous, and near it is the post and telegraph office.

The house of Corry is situated among trees on the western shore of the bay; the farm buildings, Temperance Hotel, and the Wash House are noticeable.

**Pier.**—Corry Pier extends nearly 200 yards east-southeastward from the western shore, and there is a depth of 12 to 13 feet (3.7 to 4 m.) at its head; steam vessels, running between Kyle of Lockalsh and Portree, call daily. The pier is the only good landing place in the bay.

**Light.**—A fixed white lantern light is exhibited from a post on the north corner of the head of the pier, and two additional fixed white lights are shown from the pier when steam vessels are expected.

A little southward of Corry Pier is the mouth of Broadford River, where vessels safely remain all the winter, and eastward of the river entrance is a small pier, used chiefly for shipping lime, in which there is an active trade, but at low water a good part of it is dry.

**Ben na Caillich** is a mountain 2,395 feet (730 m.) high,  $2\frac{1}{4}$  miles westward of Corry; its northern side falls vertically, but its southern side is smooth and rounded.

**Anchorage.**—The best anchorage in Broadford Bay is in about 6 fathoms (11 m.) good holding ground, with the outer end of Corry Pier bearing  $275^\circ$ , distant from 300 yards to 500 yards.

**Tides.**—It is high water, full and change, in Broadford Bay at 6h. 16m.; springs rise  $15\frac{1}{2}$  feet, neaps 11 feet; neaps range 7 feet. There is no tidal current in the bay.

**Scalpay** is separated from Skye by Scalpay Sound, and from the southern end of Raasay by Caol More; it is  $3\frac{1}{2}$  miles long north-west and southeast,  $2\frac{1}{2}$  miles wide, and rises abruptly from its southern and southwestern coasts to a height of 1,289 feet (392.9 m.) The northern and northeastern coasts are rocky, and fronted by rocky ledges extending in places 200 yards offshore.

**Eilean Guillamon** lies at the southeastern entrance to Scalpay Sound, and distance 800 yards from Scalpay; it is 70 feet (21.3 m.) high, the northeast coast being broken cliffs; the island should not be closed to a distance less than 200 yards.

**Longay** ( $57^\circ 19' N.$ ,  $5^\circ 53' W.$ ), 1,800 yards east-northeastward of the eastern part of Scalpay, is 1,200 yards long northward and southward, with a greatest breadth of 800 yards, and 208 feet (63.4 m.) high. Its coast is steep and in some parts cliffy, but the low-water line extends off 150 yards, nearly all round, and a large detached rock, the highest part of which dries 13 feet (4 m.) lies 300 yards off the northern point. The channel between Scalpay and Longay is clear and deep.

**Tidal currents.**—Between Scalpay and Longay the current runs southward from  $5\frac{3}{4}$  hours before until a quarter of an hour after high water, and northward from a quarter of an hour after high water until  $5\frac{3}{4}$  hours before the next high water; both currents have a rate of 2 knots at springs.

**Sgeir Dhearg**, 1.2 miles northwestward of Longay, is an islet about 100 yards in extent and 21 feet (6.4 m.) high; rocks dry off 100 yards around it.

**Gulnare Rock**, 600 yards southwestward from Sgeir Dhearg and  $\frac{1}{2}$  mile from Scalpay, is of small extent and awash at low water.



**Buoy.**—It is marked on its western side by a red conical buoy in  $3\frac{3}{4}$  fathoms (6.9 m.).

The eastern extremity of Rona, in range with the western extremity of Sgeir Dhearg,  $356^\circ$ , leads eastward of the rock.

**Sgeir Tharsuinn**,  $82^\circ$ , about 2 miles from the northern point of Scalpay and 1,400 yards off its northeast coast, is a rock 300 yards long north-northeast and south-southwest and 200 yards broad which dries 12 feet (3.7 m.).

**Beacon.**—A red iron beacon, surmounted by a barrel-shaped cage, 30 feet (9.1 m.) high, stands on the rock.

Rudh an Uillt Dharaich just open northward of Scalpay,  $253^\circ$ , leads 300 yards northward of the rock.

A 3-fathom (5.5 m.) patch lies between Sgeir Tharsuinn and Gulnare Rock, and the bank on which these rocks and Sgeir Dhearg are situated has an uneven irregular bottom. There is, however, a clear navigable channel 700 yards wide between it and Scalpay, and the southwestern extremity of Longay, in range with the summit of Ben na Caillich (to the westward of Kyle Rhea),  $121^\circ$ , leads through it. Sgeir Dhearg, Gulnare Rock, and Sgeir Tharsuinn are covered by the red sector of Point of Ayre Light and by South Rona Light, which latter light is obscured just to the westward of Sgeir Tharsuinn.

**Scalpay Sound** (Caolas Scalpay) ( $57^\circ 17' N.$ ,  $6^\circ 00' W.$ ), the channel between Scalpay and Skye, is 500 yards across at its narrowest part, 2 miles within Eilean Guillamon, where an extensive rocky ledge stretches from Skye toward and nearly meets a rocky reef extending from Scalpay; the point of this reef is marked by a small iron beacon surmounted by a ball which is 6 feet (1.8 m.) high. The narrow channel between the ledge and reef has a depth of 1 foot (0.3 m.) at low water and 16 feet (4.9 m.) at high-water springs, and therefore it must be considered unnavigable.

**Loch na Craig** is the southeastern part of Scalpay Sound, and with most winds the squalls in it are very heavy and uncertain in direction; the winds from off the high cliffs and mountains on either side come down on the water with a most violent force, and therefore it is not advisable for a sailing vessel to take shelter in this loch, though it is easy of access, the depth moderate, and holding ground good. There is a clear  $6\frac{3}{4}$ -fathom (12.3 m.) passage northward of Eilean Guillamon, but a ledge of limestone rocks extends from near Scalpay House, two of the rocks being marked by beacons, and in this vicinity the 5-fathom (9.1 m.) curve is about 400 yards off the points of the coast. The southern shore is fringed with shoals to the distance of 200 yards, and Sgeir Fasair Cholle, a half-tide rock, lies 300 yards off the western side of Camus na

Sgianadin, a small shallow bay. Anchorage can be obtained in 5 to 6 fathoms (9.1 to 11 m.) with the iron beacon on the northern side of the narrows in range with the schoolhouse on the western shore of Loch na Cairidh.

**Caol More**, the channel between Scalpay and Raasay, is  $\frac{3}{4}$  mile wide, and clear and deep in the fairway, but banks with less than 5 fathoms (9.1 m.) extend  $\frac{1}{4}$  mile southward of the Point of Ayre, Raasay, and nearly 200 yards off the northern coast of Scalpay. It leads into Scalpay Sound, Loch Sligachan, and Raasay Sound. It is said that often when there are strong breezes around it is calm in Caol More.

**Light**.—A flashing white light with red sector, 16 feet (4.9 m.) above water, visible 8 miles, is shown from a small white tower on Point of Ayre, the southeastern extremity of Raasay ( $57^{\circ} 20' N.$ ,  $6^{\circ} 01' W.$ ). See Light List.

The lighthouse is connected by telephone with the post office at Ramsey Man.

**Eilean Leac na Gainimh** is a small grassy islet 16 feet (4.9 m.) high, lying 300 yards eastward of the north point of Scalpay, and nearly 100 yards from the shore. Rocky ledges, which dry at low water, extend 200 yards from the islet.

The coast of Scalpay for about a mile eastward of the islet is foul within a distance of about 400 yards.

**Camus na Geadaig** is a shoal bight, nearly a quarter of a mile deep, on the north coast of Scalpay. The bottom is sandy, and vessels of moderate size can obtain temporary anchorage off it during southerly winds, in 6 fathoms (11 m.), with a white cottage within the beach at the head of the bay bearing  $126^{\circ}$ , and the north point of Scalpay,  $70^{\circ}$ , but the 3-fathom (5.5 m.) curve is only 150 yards inside this position.

**Loch na Cairidh** ( $57^{\circ} 18' N.$ ,  $6^{\circ} 02' W.$ ), the northern portion of Scalpay Sound, is about 3 miles long, and on its western side is the entrance to Loch Ainort.

The part northward of Loch Ainort is about  $1\frac{1}{4}$  miles in length,  $\frac{3}{4}$  mile in width, and has deep water, but a bank with less than 4 fathoms (7.3 m.) extends 400 yards eastward from Maol Ban, the northern point of Loch Ainort, and a bank with from 4 to 7 fathoms (7.3 to 12.8 m.) extends 800 yards off the opposite shore, the depths between being irregular.

The part southward of Loch Ainort shoals from both shores, the least water,  $3\frac{1}{4}$  fathoms (5.9 m.) extending from a low point of Scalpay, on which is a white herring stone. Farther southward there are depths of from 4 to 5 fathoms (7.3 to 9.1 m.) eastward of mid-channel, and good anchorage in 5 fathoms (9.1 m.) off the schoolhouse, which stands on the western shore.

This loch has for several years been the station of a large herring fishery, and is the rendezvous for great numbers of fishing vessels during the season. It is an excellent harbor for these small vessels, being well sheltered from all winds and having but little tidal current.

**Loch Ainort** is entered from Loch na Cairidh, and is sheltered by Scalpay. It extends southwestward 2 miles, with a general breadth of half a mile, and is surrounded by high mountains of unusual shape, forming ravines through which the wind becomes concentrated into fierce and dangerous squalls and flurries, often fatal to fishermen. This loch is, therefore, no safe place for a vessel at the best of times, and it is undesirable to go into it.

**Tidal currents.**—In Caol More the currents are weak the rate never exceeding a knot at springs; the east-going current runs during the rising and the west-going current during the falling tide.

In Scalpay Sound the current runs southward and southeastward during the rising and westward and northward during the falling tide; the currents have a greatest rate of 1 knot at springs.

There is no tidal current in Loch Ainort.

**Loch Sligachan**,  $2\frac{1}{2}$  miles northward of Loch Ainort, and  $1\frac{1}{2}$  miles southward of Raasay Narrows, has a very narrow entrance, with shoals and rocks on both sides, and a least depth of  $2\frac{3}{4}$  fathoms (5 m.) in the fairway at low water. The loch extends southwestward nearly 3 miles, with a general width of 700 yards and depths of from 4 to 12 fathoms (7.3 to 21.9 m.). It is surrounded on all sides by high steep mountains; An Coileach, 2,205 feet (672.1 m.) high, and Ben Glamair, 2,670 feet (813.8 m.) high, lie about 1,800 yards to the southward. Sconser Lodge, a cottage style of house, with a few trees around, is on the southern side of the entrance, and a jetty extends northeastward about 90 yards from the shore near it. The loch is notorious for heavy squalls, which come down with such force that boats without mast or sail are sometimes capsized.

Bo Sligachan is the outer rock of a reef extending from the southern shore and lies 950 yards  $52^\circ$  from Sconser Lodge; it dries at low-water springs. The bank, with less than 5 fathoms (9.1 m.), extends about 800 yards eastward of Bo Sligachan.

Rudh' an Torra More ( $57^\circ 19' N.$ ,  $6^\circ 06' W.$ ), the northern entrance point, is low and grassy, and from it An Corram, a spit of sand and shingle, dries off south-southeastward 400 yards. The water is deep immediately southward of the point of this spit, and here is the narrowest part of the channel, 150 yards wide between the low-water banks on each side. At 250 yards north-

westward of the end of the spit, shoal water, with a greatest depth of  $2\frac{3}{4}$  fathoms (5 m.) stretches across the channel.

The whole of the loch affords good anchorage, so far as depth of water and the nature of the bottom are concerned. A shoal, with  $4\frac{1}{4}$  fathoms (7.8 m.) water, lies near the middle of the loch, 1 mile westward of the entrance, and a gravelly low-water point on the northern side projects 200 yards from the foot of the first burn, with shoal water extending 100 yards farther into the channel. Sligachan Hotel, a conspicuous white building, stands on the main road between Portree and Broadford,  $\frac{1}{2}$  mile above the head of the loch, which dries out  $\frac{3}{4}$  mile, exposing a flat of mud and sand, forming oyster beds.

A ferry crosses the mouth of the loch just within the narrows; it is 750 yards wide between the landing places.

The western end of Sconser Lodge in range with the peak of Glamair,  $215^\circ$ , leads in until about 250 yards from Sconser Lodge, when the course into the loch is  $285^\circ$ ; but a pilot can be obtained at Balmeanach or Sconser, and no stranger should enter the channel into the loch without one.

**Tides.**—It is high water, full and change, in Loch Sligachan at 6h. 22m.; the tidal current is only felt at and near the narrows, where the currents attain a rate of about  $1\frac{1}{2}$  knots at springs.

**Raasay** is  $11\frac{1}{2}$  miles long north and south, with a breadth varying from 3 miles to 600 yards, and it is separated from South Rona by Caol Rona. The most remarkable feature in Raasay is the Dun Caan of Raasay, a mountain 1,444 feet (440.1 m.) high, terminating in a small fortress-like hillock with a truncated summit, which has the same appearance from all directions excepting from the north-eastern part of the Sound of Raasay.

The southern half of the island partakes of a mountainous character, many of the hills exceeding 1,000 feet (304.8 m.) in height; their western sides slope gradually to the sea, while the eastern sides terminate in cliffs varying from 400 to 900 feet (121.9 to 274.3 m.) in height. The northern portion of the island, except Ben na Iolaire, is comparatively low.

The east coast is nearly straight and steep-to, without off-lying islands; the northern and southern parts of the west coast are more broken.

The population of Raasay was 324 in 1911.

**South Rona Island** is nearly  $4\frac{1}{2}$  miles in length north and south, with a greatest breadth of about  $1\frac{1}{4}$  miles; it has a bare, irregular, rugged outline, with small patches of verdure, but with very little cultivation; it is 398 feet (121.3 m.) high, and several hills about 200 to 300 feet (61 to 91.4 m.) in height extend as a ridge

nearly along the middle but rather toward the eastern side of the island, where they fall steeply to the sea. The eastern coast is nearly straight, but the western coast is broken into bays, one of which, Acarseid More, is a safe harbor, but small and difficult of access.

The population of South Rona was 133 in 1911.

The eastern coasts of Raasay and South Rona, on the western side of Inner Sound, are free from shoals, and there is very little difference between the high and low water lines; the water is deep generally at 200 yards offshore, but in places it is shoal for 400 yards. The southern part of the coast of Raasay is cliffs of calcareous grit and limestone.

**Brochel Castle**, in ruins, on the east coast about  $6\frac{1}{2}$  miles northward of Point of Ayre Lighthouse, is noticeable.

**Ru ard Ghlas**, the northeastern extremity of Raasay and the southern entrance point to Caol Rona, about  $3\frac{1}{2}$  miles northeastward of Brochel Castle, is 29 feet (8.8 m.) high.

**Caol Rona**, between South Rona and Raasay, is 800 yards in width, but the southeastern entrance is partly obstructed by three islands, leaving two deep-water channels, each 200 yards in width, between them. The east coast of Eilean Tigh, which forms the western side of the sound, is steep-to.

**Eilean Sheamairach**, the nearest of the three islands in the southeastern entrance to Raasay, is a small grassy topped island about 40 feet (12.2 m.) high, on either side of which is a channel. Rocks extend 100 yards off its western and northern sides, while a detached 6-foot (1.8 m.) rock lies the same distance from its eastern side.

**Eilean Fhraoich** ( $57^{\circ} 31' N.$ ,  $5^{\circ} 59' W.$ ), the next island north-eastward, is about 40 feet (12.2 m.) high, with a little grass at the top; Sgeir nan Eun, a small high-water rock, lies 100 yards from its southeastern end. Between Eilean Fhraoich and Garbh Eilean, which rises to a double peak 197 feet (60.1 m.) high, there is no channel for vessels, nor is there any between the latter and South Rona.

Sailing vessels should not attempt to go southward through the Caol Rona with the wind southward of west-southwest, and with a leading wind the best channel is westward of Eilean Sheamairach, with the coast of Raasay well aboard.

**Tides**.—It is high water, full and change, at Caol Rona at 6h. 33m. The tidal current sets southward through Caol Rona from about 5 hours after high water until three-quarters of an hour before the next high water and to the northward from three-quarters of an hour before until 5 hours after high water; the rate of the currents is moderate.

**Light.**—A flashing white light, 222 feet, (67.7 m.) above water, visible 21 miles, is shown from a white tower, 42 feet (12.8 m.) high, on the northeastern point of South Rona Island. See Light List.

**Gamhnachain.**—A number of rocks extend northward from the northern end of South Rona, some of which are above water and others cover. Gamhnachain, the outer of these rocks, is awash at low water, and lies with the lighthouse bearing  $175^{\circ}$ , distant 1.1 miles; it is steep to around, except toward the island, and the fall of Ben Liughach in range with Rudha na h Uamha, Loch Torridon,  $102^{\circ}$ , leads 500 yards northward of it; see view on chart.

There is a depth of from 4 to 10 fathoms (7.3 to 18.3 m.) among these rocks, but it is not safe for any vessel to pass between them.

**Tidal currents.**—The currents in Inner Sound are weak and somewhat irregular, but set generally south with the rising and north with the falling tide. Near the head of the sound the currents are of some strength, more especially over the shallower water between Scalpay and Longay, and between Crowlin Islands and the mainland.

**Sound of Raasay—South Rona Island—West coast—Loch Bhraigh** ( $57^{\circ} 35' N.$ ,  $5^{\circ} 58' W.$ ), a bight in the northern end of South Rona immediately westward of South Rona Lighthouse, is open to the northward. The stores for the lighthouse are landed at a small pier in a cove on the eastern side of the loch.

Sgeir Shuas, a double-headed high-water rock, lies about 200 yards off the northern point of the loch, and a rock with 12 feet (3.7 m.) water lies in the fairway of the entrance with Sgeir Shuas bearing  $50^{\circ}$ , distant 600 yards.

When running into the loch give its northeastern shore a wide berth, as several rocks lie nearly 200 yards off it, and anchor in 10 fathoms (18.3 m.) 200 yards from the southwestern shore with the lighthouse bearings about  $70^{\circ}$ .

**Acarsaid Thioram**, a bay on the western side of South Rona 2 miles southward of Loch Bhraigh, is unsuitable for anchorage, but shelter may be found for boats in the northeastern corner, a little within which is a small village of the same name.

**Acarsaid More**, on the western side of South Rona about 1,600 yards southward of Acarsaid Thioram, has a very narrow entrance, but inside there is an area about 200 yards in extent with good anchorage. The best entrance is southeastward of Eilean Garbh; it is less than 100 yards in width, but has depths of from 2 to 5 fathoms (3.7 to 9.1 m.). Eilean Garbh is a small heath-covered islet 124 feet (37.8 m.) high; a rock which dries 9 feet (2.7 m.) lies in mid-channel 250 yards eastward of the island; in passing it the southeastern shore must be kept very close aboard.

Widows Cot, a small solitary cottage at the head of the harbor, bearing  $40^\circ$ , just open southeastward of the northern entrance point (see view on chart), leads into Acarseid More and close southeastward of the rock, 200 yards eastward of which is anchorage in  $3\frac{1}{2}$  fathoms (6.4 m.), mud bottom. Small vessels run to the head of the bay and anchor in 2 fathoms (3.7 m.), sheltered from wind and sea. There is a passage northward of Eilean Garbh, but it is difficult to make out, and there are low-water rocks in its entrance and also for 100 yards northeastward of Eilean Garbh.

**Caution.**—A stranger should not run for this harbor except from urgency; the entrance is very blind, as Eilean Garbh is similar in appearance to the adjacent land.

**Raasay—West coast—Eilean Tigh**, the northern extremity of which is situated 1 mile southwestward from Eilean Garbh, with Caol Rona between, is rugged, rocky, and 356 feet (108.5 m.) high. Its southern end is connected with Raasay at low water but separated from it at high water by a narrow cut a few yards wide, close to which are a few fishermen's cottages. The island is steep-to except at its northwestern point.

**Loch a Sguirr** ( $57^\circ 20' N.$ ,  $6^\circ 00' W.$ ), at the northern end of Raasay lying between Eilean Tigh and Fladday, 1 mile to the southwestward, is about 1 mile deep and quite open to the northward, with deep water and rock bottom.

**Ben na Iolaire**, on the southern side of Loch a Sguirr, is 823 feet (250.8 m.) high, rocky, and sterile, except for a few patches of ferns which grow in the niches of the rock.

**Fladday** is  $1\frac{1}{4}$  miles long north and south, about  $\frac{1}{2}$  mile broad, flat topped, and 133 feet (40.5 m.) high. Toward the southeastern end is a village, with some little cultivation. About  $\frac{1}{4}$  mile from its southern end it is connected with Raasay at low-water springs.

**Bo na Faochag**, a small rock with 6 feet (1.8 m.) water and steep-to around, lies 600 yards,  $345^\circ$ , from the northern end of Fladday.

**Bo na Currachie**, awash at low water, lies 400 yards north-northeastward from Griana Sgeir and 250 yards from Fladday. The western extremity of Raasay open of Griana Sgeir,  $201^\circ$ , leads westward of this rock and of Bo na Faochag.

**Griana Sgeir**, a small rocky islet 20 feet (6.1 m.) high, with a grassy top, lies 400 yards from the western side of Fladday; its western coast is steep-to.

**Bo Leachan**, with 4 feet (1.2 m.) water, lies 700 yards southward from Griana Sgeir, and there are two patches of  $2\frac{1}{2}$  and 4 fathoms (4.6 and 7.3 m.) respectively, between. The northwestern point of Eilean Tigh open of Griana Sgeir,  $32^\circ$ , leads northwestward of these rocks.

**Fladday Harbor**, on the eastern side of the southern point of Fladday, is 200 yards wide, with from 10 to 4 fathoms (18.3 to 7.3 m.) water, and is a safe little place when in. The entrance is from the southwestward, between Ard an Torrain and Fraoch Eilean, and is 100 yards wide, with 3 fathoms (5.5 m.) water; whence the distance to the anchorage is  $\frac{1}{2}$  mile. Glas Eilean, 22 feet (6.7 m.) high, and several other islets and rocks, lying between Fraoch, Eilean, and Fladday, obstruct the northern approach to Fladday Harbor. A stranger should not attempt to run for it, as one of the islets to the northward might easily be mistaken for Fraoch Eilean.

**Loch Arnish**, southward of Ard an Torrain, is about  $\frac{3}{4}$  mile deep to the southeastward and  $\frac{1}{2}$  mile wide. It is open to north-westerly winds and unsuitable for anchorage, the bottom being rock, uneven, and generally from 16 to 27 fathoms (29.3 to 49.4 m.) deep. A rocky patch, with 6 feet (1.8 m.) water, extends more than 200 yards from the middle of the southwestern shore of the bay.

Wood of natural growth and cultivated patches skirt the eastern shore of the loch, and Arnish Village stands on the rising ground above.

**Ru Manish** ( $57^{\circ} 28' N.$ ,  $6^{\circ} 03' W.$ ), the southwestern point of Loch Arnish, is long and low, with more rock than herbage on it. Rocks dry off nearly 200 yards from the point, and  $\frac{1}{4}$  mile to the southwestward is Eilean Manish, a small islet joined to the shore at low water.

**Comet Rock**, awash at low water springs, lies 300 yards southward from Eilean Manish and nearly 150 yards offshore.

**Rock**.—A rock with 2 feet (0.6 m.) water lies 1,200 yards southwestward from Eilean Manish and 400 yards from the shore. The highest part of Eilean Tigh, seen over Fladday, well open northwestward of Eilean Manish, about  $33^{\circ}$ , leads northwestward of both these rocks.

**The west coast** of Raasay from Ru Manish to Churchton Bay, a distance of 7 miles, is sloping braes, with patches of wood and cultivation, with occasional small beaches of gravel.

**Eilean Holoman**, 5 miles southward of Eilean Manish, and connected with the shore at low water, is 50 feet (15.2 m.) high and covered with heather and grass. A rocky spit, with  $1\frac{3}{4}$  fathoms (3.2 m.) water near its outer end, extends 200 yards northward from the island. The small bay on its northeastern side is rocky, with general depths of from 5 to 10 fathoms (9.1 to 18.3 m.).

About  $\frac{1}{4}$  mile southeastward of Eilean Holoman and near the beach is Holoman Kirk and manse, surrounded by a white inclosure, which show prominently from the sound.



**Sgeir Chnapach** is a small round rock 10 feet (3.1 m.) high, lying 1,400 yards south-southwestward from Eilean Holoman, and 600 yards northwestward from the coast of Raasay. One hundred yards southeastward of Sgeir Chnapach is a long rock which dries 11 feet (3.4 m.), and westward of it is a rocky bank with general depths of from 12 to 18 fathoms (21.9 to 32.9 m.), but with three heads of 6, 7, and 8 fathoms (11.0, 12.8, and 14.6 m.), respectively, the latter and outer shoal being situated  $\frac{1}{2}$  mile  $236^\circ$  from Sgeir Chnapach.

**Ebbing Rock**, 267 yards off the coast of Raasay, southeastward of Sgeir Chnapach, is small and dries 8 feet (2.4 m.).

A rocky ridge, with a depth of about 6 fathoms (11 m.), joins Sgeir Chnapach and Ebbing Rock, and there is a channel, 100 yards in width with  $4\frac{1}{2}$  fathoms (8.2 m.) water, inside Ebbing Rock.

**Oskaig Point**, a projecting grassy lump 62 feet (18.9 m.) high, situated about 1 mile southward of Eilean Holoman, forms, with Long Rock, a narrow rocky ridge 9 feet (2.7 m.) high 350 yards to the southwestward, a little harbor affording shelter for small vessels in westerly or northerly winds. Between Long Rock and Goat Island, 1,800 yards to the southward, are two or three shoal patches extending rather more than 100 yards from the shore.

**The Narrows of Raasay** ( $57^\circ 21' \text{ N.}, 6^\circ 05' \text{ W.}$ ), at the southern end of the Sound of Raasay, is about  $\frac{1}{2}$  mile wide between Goat Island and Old Castle Point, the northern point of the peninsula of the Aird, in Skye, which bounds the western side of the narrows.

**McMillan Rock**, 100 yards in length north and south, with 2 feet (0.6 m.) least water, lies 850 yards  $0^\circ$  from Old Castle Point and nearly in the fairway of the northern entrance to the narrows.

**Lightbuoy**.—A lightbuoy, painted red and white in horizontal stripes, exhibiting a white flashing light, is moored in  $6\frac{1}{2}$  fathoms (11.9 m.) nearly 100 yards southward of the rock.

**Rock**.—A patch, with  $2\frac{1}{2}$  fathoms (4.6 m.) least water and 6 to 7 fathoms (11 to 12.8 m.) around, lies midway between McMillan Rock and Goat Island.

Suisnish Cottage, in range with the southwestern side of Goat Island  $123^\circ$ , leads just northward of the  $2\frac{1}{2}$ -fathom (4.6 m.) patch and about 133 yards northeastward of the shoal water extending from McMillan Rock. Suisnish Cottage is the southernmost house on the southeastern shore of Churchton Bay; it is a two-storied slated dwelling of a bluish-colored stone, 91 feet (27.7 m.) above the sea.

**Goat Island**.—Carngarave Point, wooded and 85 feet (25.9 m.) high, is on the northern side of Churchton Bay, and Goat Island, a small rocky islet 25 feet (7.6 m.) high, lies 100 yards southwestward of the point and is connected with it at low water.

A patch, with 1 fathom (1.8 m.) least water, lies 200 yards westward from Goat Island, with a narrow deep-water channel between.

The flagstaff on the knoll just above the landing place in Churchton Bay in range with the southern end of Goat Island, bearing  $58^{\circ}$ , leads southward of the shoal.

**Churchton Bay**, to the southeastward of Goat Island, is only suitable for anchorage in summer, the squalls in winter from the Skye Mountains being at times of great violence, and even during summer it is sometimes necessary to run to the northward for shelter.

Raasay House stands on slightly rising ground about 600 yards eastward of Carngarave Point, protected on the northern side by a wooded hill, and other buildings, including a post and telegraph office, are situated to the southward of it.

A quarter of a mile eastward of Goat Island is a knoll with a flagstaff, on the southeastern side of which is a slip for boats, and on its northwestern side a pier projects in a northwesterly direction; which affords good shelter for landing in southwesterly winds, but at low water it is completely dry. The two Perch Rocks which dry 8 feet (2.4 m.), each marked by a perch, lie about 200 yards southwestward of the flagstaff.

The whole of the southeastern side of the bay is shallow. Rocks with 3 feet (0.9 m.) water extend over 200 yards, and the 5-fathom (9.1 m.) curve is nearly 600 yards from the shore.

The school, an Elizabethan cottage, stands  $\frac{1}{4}$  mile southeastward of the flagstaff.

A submarine telegraph cable connects Raasay with Skye. The landing places are marked by beacons.

The mail steamers between Mallaig and Portree call daily, except Sundays.

**Anchorage.**—The best anchorage for small vessels in Churchton Bay is in  $5\frac{1}{2}$  fathoms (10.1 m.) 500 yards  $173^{\circ}$  from the flagstaff on the knoll, the ground being clay under sand. Between the Perch Rocks and Goat Island the ground is also good, but the space is limited.

**Jackal Rock**, with  $21\frac{1}{4}$  fathoms (4.1 m.) water, lies with Suisnish Cottage bearing  $60^{\circ}$ , distant 650 yards.

**Buoy.**—A black can buoy is moored in  $33\frac{1}{4}$  fathoms (6.9 m.) on the southwestern side of Jackal Rock.

**Shoals.**—A small shoal, with 3 fathoms (5.5 m.) water, lies 300 yards  $13^{\circ}$ , and a similar shoal, with  $4\frac{1}{2}$  fathoms (8.2 m.) water, 200 yards  $315^{\circ}$  from Jackal Rock.

**The coast** of Raasay trends southward from the vicinity of Suisnish Cottage nearly half a mile to Suisnish Point, and the 5-fathom (9.1 m.) curve from just outside Jackal Rock to 200 yards off the point.

From Suisnish Point the coast trends southeastward 700 yards to Rudha na Cloiche on the northern shore of Caol More, and thence eastward one mile to the Point of Ayre; a gravelly low-water line extends off 100 yards. Temporary anchorage in from 12 to 15 fathoms (21.9 to 27.4 m.) may be had along any part of this coast at about 400 yards.

**Suisnish Point—Pier.**—A pier with a crosshead has been built about 300 yards southeastward of Suisnish Point, extending nearly out to the 3-fathom (5.5 m.) curve, as charted.

**Lights.**—A fixed red and a fixed green light, 32 and 25 feet (9.8 and 7.6 m.), respectively, above water, visible 5 miles, are shown from Suisnish Pierhead.

**Tides.**—It is high water, full and change, in the narrows of Raasay (Churchton Bay) at 6h. 23m.; springs rise 16½ feet, neaps 11 feet. The current runs southward from 5¾ hours before until three-quarters of an hour before high water, and northward from three-quarters of an hour before high water until 5¾ hours before the next high water. The rate of the currents is from 1½ to 3 knots.

In Churchton Bay an eddy runs to the northward while the south-going current is running in the narrows, with a rate of about one knot at springs.

**Isle of Skye—East coast—Torr More**, immediately northward of the entrance to Loch Sligachan, is a grassy peninsula 105 feet (32 m.) high, with a cliffy face to the eastward. Rocky ledges, which dry at low-water springs, extend eastward 400 yards from the peninsula.

**Balmeanach Bay** (57° 20' N., 6° 06' W.), northward of Torr More and southward of and sheltered by the Aird, affords good anchorage in its northern part in from 8 to 10 fathoms (14.6 to 18.3 m.), except with southeasterly winds; the best position is with the Ugag Point, which projects about 100 yards into the middle of the bay, bearing 245°, distant 350 yards. The southern portion of the bay is shoal, the 3-fathom (5.5 m.) curve extending about 400 yards from the shore, and shoaling suddenly from 10 fathoms (18.3 m.).

**The Aird**, 1½ miles northward of the entrance to Loch Sligachan, is a peninsula extending half a mile north and south on the western side of the narrows of Raasay, its southern part being connected to Skye by an isthmus 600 yards in length. Meall Bane, a hillock at its southern end, is 80 feet (24.4 m.) high. The eastern coast of the peninsula, and Old Castle Point, its northern end, are rocky.

Eastward of Meall Bane, at 60 yards from the shore, with which it is connected at low water, is a cliffy rock 17 feet (5.2 m.) high.

**Rainy Rocks** are ledges extending over 200 yards eastward from Meall Bane, the outer one drying 1 foot (0.3 m.) at low-water springs.

Shoal water extends 200 yards eastward of the cliffy rock off Meall Bane, and foul ground extends 300 yards south-southeastward from Rainy Rocks. The eastern coast of the Aird should not be approached within  $\frac{1}{4}$  mile.

Sgeir Chnapach in range with the western side of Goat Island, 358°, leads nearly 100 yards eastward of the 5-fathom (9.1 m.) curve.

**Penfold Rock**, 700 yards, 107°, from the northern extremity of Old Castle Point, is small, and has  $1\frac{3}{4}$  fathoms (3.2 m.) water; a small rocky shoal, with  $2\frac{1}{2}$  fathoms (4.6 m.) water, lies 300 yards southeastward of Old Castle Point and nearly 200 yards offshore.

The school and post office at Upper Ollach, on the coast of Skye, just open northward of Old Castle Point, 282°, leads 50 yards northward of both these shoals.

**Camus a More Bheoil**, the bay northward of the isthmus joining the Aird to the Isle of Skye, is open to northerly winds which send in a heavy swell. The bay is shoal toward its head, the 3-fathom (5.5 m.) curve extending nearly 600 yards from the beach, whence the soundings deepen gradually to the northward, with a sandy bottom.

The Bow, a narrow reef 150 yards in length north-northeast and south-southwest, lying in the central part of the bay, with its southern end nearly 400 yards offshore, is awash at low water, and a rock near its middle dries 3 feet (0.9 m.).

There is a depth of  $5\frac{1}{4}$  fathoms (9.6 m.)  $\frac{1}{4}$  mile northward of the Bow.

**Ollach Rock** (Sgeir Dubh) (57° 21' N., 6° 07' W.) is a bare islet about 10 feet (3.1 m.) high, lying 700 yards 305° from Old Castle Point. Shoal water extends nearly 150 yards off its southern side and 67 yards off its eastern side.

There are depths of 8 to 10 fathoms (14.6 to 18.3 m.) between it and the shore.

**The Coast** of Skye from nearly  $\frac{1}{2}$  mile westward of the Aird trends northward  $2\frac{1}{4}$  miles to the head of Camus Tianavaig and has a moderately steep slope. Numerous cottages are scattered along the braes. Westward of Ollach Rock and near the shore are the school and post office of Upper Ollach, which are noticeable from the Sound of Raasay.

Temporary anchorage in  $4\frac{1}{4}$  fathoms (7.8 m.), sand bottom, can be obtained in Camus Tianavaig during westerly winds. Between Camus Tianavaig and Portree,  $2\frac{1}{2}$  miles farther northward, the coast

is the base of Ben Tianavaig and is steep-to until within 1,600 yards of An Tom Point, the southern point of the entrance to Portree.

Black Rock, 6 feet (1.8 m.) high; Pin Rock, 2 feet (0.6 m.) high, and several low-water rocks extend about 200 yards off the coast from 1,600 yards southward of An Tom Point to that point.

**Ben Tianavaig**, 1,800 yards southward of An Tom Point, is 1,345 feet (409.9 m.) high; its cliffs as seen from the sound are remarkable, the upper parts having pinnacles and overhanging stones and the lower parts being perforated deeply with caves.

**Portree Harbor** is a roomy anchorage 20 miles southward of Rudha na h Aiseig, the northern end of Skye. The harbor is the inner part of a bay extending westward about  $1\frac{1}{2}$  miles from its entrance between An Tom Point and Rudha na Airde Glaise,  $1\frac{3}{4}$  miles to the northward. At 1,800 yards within An Tom Point the width of the harbor is about  $\frac{1}{2}$  mile. The harbor is well sheltered, Raasay protecting it from easterly winds, and the mountains on each side, crowned with dark trap cliffs, give it a unique character; the land at the head of the bay being much lower, the entrance can be recognized on a dark night. With strong westerly winds violent squalls may be expected.

**Depth.**—The 20-fathom (36.6 m.) curve crosses the entrance to the harbor in a curve bending a little inward, and the depths decrease irregularly to 10 fathoms (18.3 m.) northward of Vriskaig Point, and thence rapidly to 10 feet (3.1 m.).

**Scorr** ( $57^{\circ} 24' N.$ ,  $6^{\circ} 09' W.$ ) is a small extent of sloping cultivated land, with a cluster of huts on the rising ground on the southern side of the harbor  $\frac{1}{2}$  mile within An Tom Point. The southern shore is fringed with shoal water for about 100 yards and Scorr Skerry, a rock, extends a similar distance off at Scorr. Viewfield House, conspicuous on the rising ground westward of the Lump and partly inclosed in plantation, well open northward of Vriskaig Point, and bearing  $268^{\circ}$ , leads northward of the rock and all shoals on the southern shore. Westward of Scorr, the shore falls back into a clean sandy bay.

**Vriskaig Point**,  $1\frac{1}{3}$  miles within An Tom Point, is a raised terrace 150 feet (45.7 m.) high; it is steep-to on its northern and eastern sides; Portree Loch, an inlet, extends 1 mile southwestward on its western side, and it is filled by an extensive muddy flat, which dries at low water.

**The northern shore** from Rudha na Airde Glaise trends west-southwestward 1.3 miles and then turns northwestward to the head of the harbor. The 5-fathom (9.1 m.) curve is 150 yards off it in places, and Viewfield Rock with less than 6 feet (1.8 m.) water lies 130 yards offshore about 450 yards northeastward of Sgeir More.

**Sgeir More** is a black rock 8 feet (2.4 m.) high, 600 yards north-eastward of Vriskaig Point and 100 yards off the north shore of the harbor to which it is connected at low water; the rock, with the ledge that extends 130 yards southward from it, acts as a breakwater for boats and small craft in the inner anchorage.

**Light.**—A fixed red light, 16 feet (4.9 m.) above water, visible 4 miles, is shown from the pier at Portree.

**Anchorage.**—There is good anchorage for vessels of 12 feet (3.7 m.) and less draft in  $3\frac{1}{4}$  fathoms (5.9 m.) water, with An Tom Point just open southwestward of Sgeir More, bearing about  $160^\circ$ , and the Lodge boathouse  $350^\circ$ . This position is out of the track of vessels approaching and leaving the pier. The bottom is not very firm, and vessels must moor with a liberal scope on each chain.

There is also anchorage in 13 fathoms (23.8 m.) water about 250 yards northeastward of Vriskaig Point with the tower on the Lump bearing  $282^\circ$ .

**Tides.**—It is high water, full and change, in Portree Harbor at 6h. 21m.; springs rise 15 feet, neaps  $10\frac{3}{4}$  feet; neaps range  $6\frac{1}{2}$  feet, extraordinary springs range  $19\frac{1}{2}$  feet, and on very exceptional occasions 22 feet. There is no tidal current in the harbor.

**The Town** of Portree is situated at the head of the harbor, the houses being both on the shore and on the brae above, where they are partially hidden by trees. It contained 2,120 inhabitants in 1921. There are churches, a courthouse, banks, hotels, a post and telegraph office, a jail, and many shops.

There is no foreign trade and the only imports are coal and necessities for the inhabitants.

The most conspicuous building is the Lodge, on a hill 62 feet (18.9 m.) high, on the northeast side of the head of the harbor; it is one of the seats of Lord Macdonald of the Isles.

The Lump, a projecting bluff 120 feet (36.6 m.) high, lies southward of the town; it is wooded and on it is an ornamental tower. The pier, on the northeastern side of and protected by the Lump, has 3 to 5 feet (0.9 to 1.5 m.) alongside it at low water spring tides. The bottom is smooth and vessels can take the ground with safety.

**Communication.**—Steamers run daily (except Sunday) between Portree and Kyle of Lochalsh, the terminus of the Lochalsh and Dingwal branch of the Highland Railway, and Mallaig. Steamers run once a week to and from Gairloch, Poolewe, Ullapool, and the settlements on the northwest coast of Scotland; also, three times a week to various ports in the Outer Hebrides and on the northwest coast of Skye. The roads in Skye generally are not good.

**Supplies.**—Ship's stores are not to be had; no large supply of meat can be depended upon during the winter, nor any vegetables

except potatoes. Fresh salmon can always be obtained in season. Good water is plentiful. There is a fresh-water hydrant on the pier.

**Coal.**—Scotch coal can be obtained for steamers in moderate quantities, but Welsh coal is not kept.

**The Coast** from Dudha na Airde Glaise trends northward 10 miles to Rudha nam Braithairean, and, with two small exceptions, is everywhere steep-to, the low-water line differing little from that of high water. At Rudha nam Braithairean the coast turns north-westward nearly 9 miles to Rudha na h Aiseig, which is the north-eastern point of Skye, and on it are Staffin and Kilmaluag Bays, besides several islands and off-lying rocks. There are, however, on the whole extent of this coast northward of Portree, no shoals outside either of the islands, nor any extending more than 400 yards from the shore.

**Storr Hill**, a mountain, 2,343 feet (714.1 m.) high, is situated 5 miles northward of Rudha na Airde Glaise and  $1\frac{1}{4}$  miles inland from the Sound of Raasay; its southern slopes drain into Loch Leathan, and its northeastern into Rigg Burn, which flows into the sea  $3\frac{1}{2}$  miles southward of Rudha nam Braithairean. On a clear day from the sound and on westerly bearings this mountain, with its high cliffs and pillars near the top, is very picturesque.

At and near Rigg Burn there is some fine sloping grassy land terminating in low cliffs; farther northward, near Rudha nam Braithairean, the coast is low cliffs showing fine specimens of columnar trap half-way down, and terminating at the sea in steep sloping braes.

**Eilean Holm** ( $57^{\circ} 29' N.$ ,  $6^{\circ} 08' W.$ ), small, grassy-topped, and 89 feet (27.1 m.) high, is situated 400 yards off-shore  $3\frac{1}{2}$  miles northward of Rudha na Airde Glaise; the channel between it and the shore is nearly filled with low-water rocks projecting from each side.

**Loch Leathan Waterfall**,  $\frac{3}{4}$  mile northward of Eilean Holm, discharges at all times a considerable body of water from Loch Leathan over a high cliff into the sea. It is open when bearing  $217^{\circ}$  and is visible when over  $\frac{1}{2}$  mile from the land southward of Rudha nam Braithairean.

Rocks, which dry 4 feet (1.2 m.), extend nearly 400 yards off the coast abreast of the waterfall.

**Rudha nam Braithairean**, 6 miles northward of Eilean Holm, is a peninsula terminating in Dun Haskill, a pinnacle-shaped rock on which is a dome or lump 113 feet (34.4 m.) high; its peculiar character is very noticeable on northerly bearings. There is a depth of about  $3\frac{1}{2}$  to 7 fathoms (6.4 to 12.8 m.), 300 yards northeastward of Dun Haskill, but on each side of the peninsula rocks dry off about 300 yards.

**Red Rocks**, 1,400 yards northward of Rudha nam Braithairean and 200 yards offshore, dry at low water.

**Staffin Island**, 3 miles northward of Red Rocks and 300 yards offshore, is  $\frac{1}{2}$  mile long north and south, low, flat, grassy, and moderately bold, but the channel southward of it is so blocked with rocks that it is a passage for boats only.

**Staffin Bay**, westward of Staffin Island, is open to the northward and much swell sets in; the large smooth boulders on the shore make landing difficult. The best anchorage is abreast of the middle of the island about 400 yards from the shore in from 7 to 5 fathoms (12.8 to 9.1 m.), sand. This is the nearest anchorage from which the Quiraing can be visited, but it is only in fine weather that landing can be effected with safety.

Steamers between Portree and Dunvegan, on the northwest coast of Skye, call here.

**Sgurr More**,  $1\frac{1}{2}$  miles northwestward of Staffin Bay, is 1,774 feet (540.7 m.) high and the northernmost of the smooth-topped mountains; great masses of dislocated rock indicate the position of the Quiraing.

**Eilean Altavaig** ( $57^{\circ} 40' N.$ ,  $6^{\circ} 14' W.$ ),  $1\frac{1}{4}$  miles northward of Staffin Island, is  $\frac{1}{2}$  mile long north-northwest and south-southeast and about 600 yards broad; its eastern coast is a basaltic column or cliff 174 feet (53 m.) high; the channel inside the island is  $\frac{1}{2}$  mile wide, with from 4 to 6 fathoms (7.3 to 11 m.) water. Sgeir Eirin, a narrow bare detached rock, lies parallel with the northeastern side of Altavaig at the distance of 200 yards. The eastern side is steep-to, but low-water rocks extend north-northwestward and south-southeastward 400 yards from the rock.

The western limit of the white sector of Trodday Light passes about 200 yards eastward of Sgeir Eirin, the rock and island being covered by the green sector.

**Clach nan Ramh**, 1,400 yards northward of Eilean Altavaig, is a small rock which dries 11 feet (3.4 m.); it is steep-to around, and its black head generally shows. The western side of Staffin just open westward of Altavaig leads more than 200 yards eastward of the rock.

The coast from a waterfall westward about 600 yards from Clach nan Ramh is a vertical cliff northwestward to Kilmaluag Bay, a distance of  $1\frac{1}{2}$  miles. It is bordered by several detached rocks or columns, but no low-water shoals.

**Kilmaluag Bay**, 4 miles northward of Staffin Bay and  $\frac{3}{4}$  mile southward of Rudha na h Aiseig, is about 200 yards wide, with depths of from 5 to 3 fathoms (9.1 to 5.5 m.) sand bottom; a good deal of low-water rock extends from the southern side and head of



the bay, and on the southeastern side of the entrance is a rock which dries more than 200 yards offshore; a sunken rock also lies toward the northwestern side near the head. The anchorage is suitable for small vessels during westerly winds. The coast northward of the bay to Rudha na h Aiseig is steep-to.

**Rudha na h Aiseig**, the northeastern extremity of Trotternish Promontory, at the northern end of the Isle of Skye, is a rather low flat point with Ben Volovig, a hill 357 feet (108.8 m.) high, immediately westward of it.

**Trodday** ( $57^{\circ} 43' \text{ N.}$ ,  $6^{\circ} 18' \text{ W.}$ ), round,  $\frac{1}{2}$  mile in extent, and 145 feet (43.2 m.) high, lies nearly 1 mile northward of Rudha na h Aiseig; it is of basaltic formation, and an isolated column stands off its northeastern side.

**Light.**—A group flashing white light, with red and green sectors, 160 feet (48.8 m.) above water, visible 18 miles, is shown from a white beacon, 16 feet (4.9 m.) high, on the summit of Trodday. See Light List.

**Tidal currents.**—In the Sound of Raasay the current runs southward during the rising tide, and northward during the falling tide, but neither current has any strength until near the narrows at its southern end.

In the outer lochs in Raasay Sound there is no tidal current.

**Directions—Inner Sound.**—For vessels bound between the northward and Kyle Akin the Inner Sound is a more open and better channel than the Sound of Raasay.

From mid-channel between South Rona Lighthouse and Rudha na Fearn, at the entrance to Loch Torridon, steer southward until Rudha na Guailne bears  $70^{\circ}$ , when alter course to pass about  $\frac{1}{2}$  mile westward of Crowlin Islands. Then steer for Kyle Akin Lighthouse, bringing it to bear  $122^{\circ}$ , with the Lump open northeastward of it, on approaching the narrows.

In navigating Inner Sound at night keep South Rona Light in sight until Crowlin Light is seen, when proceed as above.

When bound through the Sound of Raasay for Kyle Akin, having passed through Caol More, it is advisable to pass northward of Sgeir Tharsuinn. To do this, steer about  $70^{\circ}$  until the whole of Longay opens eastward of Sgeir Dhearg, when a  $122^{\circ}$  course leads to Kyle Akin Light.

At night steer east into the white sector of Point of Ayre Light until South Rona Light opens, when alter course to  $122^{\circ}$ , as above.

To pass inside Sgeir Tharsuinn, Gulnare Rock, and Longay, give a berth of 400 yards to Sgeir Tharsuinn, which is marked by a beacon, avoid the low-water rock, 200 yards off the coast of Scalpay southwestward of Sgeir Tharsuinn, and leave Gulnare Rock buoy on the port hand.

The southwestern extremity of Longay, in range with Ben na Caillich  $121^{\circ}$ , leads through the channel till southward of the rocks. Give a berth of  $\frac{1}{4}$  mile to the southwestern side of Longay, whence a  $104^{\circ}$  course leads to Kyle Akin approach. In passing Paby keep Castle Maol at least twice its breadth open northward of Doctor Rock.

**Sound of Raasay.**—From  $1\frac{1}{2}$  miles eastward of Rudha nam Braithairean a  $185^{\circ}$  course leads along the coast of Skye to Portree. Except the rocks abreast of Loch Leathan Waterfall the coast of Skye is steep-to. At night Eilean Holm is difficult to distinguish under the high land. South Rona Light becomes obscured when it bears northward of  $50^{\circ}$  (approximately), which range passes close to the waterfall rocks.

The opening between the highland on each side of Portree Harbor shows by day or at night, and a westerly course, both shores in the entrance being given a berth of 400 yards, leads in.

With a very high water the outer part of Sgeir More is covered, and the lights of the town are apt to dazzle the eye so that the small top of the rock may not be observed.

From abreast of Portree,  $\frac{3}{4}$  of a mile eastward of An Tom Point, a  $173^{\circ}$  course leads to McMillan Rock; leave the rock and the light buoy marking its southern side on the port hand, and then haul up to  $127^{\circ}$ , but, to clear Penfold Rock, keep the schoolhouse at Upper Ollach open northward of Old Castle Point until Sgeir Chnapach is in range with the western side of Goat Island,  $358^{\circ}$ , when alter course to the southward. A shoal with  $2\frac{1}{2}$  fathoms (4.6 m.) water lies between McMillan Rock and Goat Island; a large vessel, therefore, should not use this channel.

After passing Jackal Rock buoy, keep from 500 to 600 yards off the coast of Raasay, through Caol More into Inner Sound, but do not approach Point of Ayre Lighthouse within 600 yards.

In working up the Sound of Raasay, the coasts of Raasay and South Rona should not be approached nearer than  $\frac{1}{2}$  mile, especially about the northern end of Raasay, where the lead is no guide, as the bottom is irregular and the water very deep in places.

A vessel caught in the northern part of the sound by a south-westerly gale should attempt to fetch Portree, but if unable to do so she should run into Staffin Bay, or at night lay-to with south Rona Light in sight.

**The coast of Skye** westward of Rudha na h Aiseig is described in Volume V.

**Loch Torridon.**—The entrance to Loch Torridon ( $57^{\circ} 36' N.$ ,  $5^{\circ} 49' W.$ ), nearly 5 miles eastward of the northern end of South Rona, is 3 miles wide; the loch trends southeastward about 6 miles and then turns eastward 5 miles to its head. The central part of

the loch is named Loch Shildaig, above which the loch is known as Upper Loch Torridon. A fisherman from any of the huts along the southern shore may be obtained to act as a pilot if required.

**Depths.**—Generally the depth of water in the loch is considerable, and there are no outlying shoals, excepting a rock southward of Sgeir na Trian in the entrance, though there are central patches of much shoaler water than around them. Thus in the entrance are three patches, on the outermost of which are from 12 to 20 fathoms (21.9 to 36.6 m.); on the next is Sgeir na Trian, a small islet, and the above-mentioned rock, and on the inner patch from 12 to 20 fathoms (21.9 to 36.6 m.), while the surrounding depths are generally between 35 and 55 fathoms (64 and 100.6 m.) until within from 600 to 800 yards of the shore.

The Kyle leading from Loch Shildaig to Upper Loch Torridon is 400 yards wide, but both shores are steep-to and the central depths are from 11 to 17 fathoms (20.1 to 31.1 m.).

**Rudha na h Uamha.**—The shore from Rudha na Fearna trends eastward 1 mile to Rudha na h Uamha and forms the southwestern side of the entrance to Loch Torridon. Rudha na h Uamha has an undulating outline, and Sgeir a Ghair, a reef which almost covers at high water, extends 400 yards northeastward from it. The southwestern shore of the loch from Rudha na h Uamha to Ru Ardheslaig, a distance of  $3\frac{1}{2}$  miles, is intersected by a number of small creeks and bays, which, except Loch Creagach, are too open for anchorage.

**Loch Creagach**, 3 miles from Rudha na h Uamha, is the best anchorage in Loch Torridon; it is protected from the swell and open only northeastward, whence there is no sea. Sgeir Ghlas lies 100 yards eastward of Camus Nose, the northern point of the bay, and there is a rock which dries at low water 100 yards southeastward from it. A rock also dries out 200 yards from the southern corner of the bay. The best anchorage is southward of Camus Nose, off the village of Kenmore, in from 8 to 6 fathoms (14.3 to 11 m.) mud, a little more than 200 yards from the shore.

**Ru Ardheslaig** ( $56^{\circ} 33' N.$ ,  $5^{\circ} 42' W.$ ), a peninsula projecting northward into the loch, rises to a hill of irregular outline 277 feet (84.4 m.) high, and the isthmus connecting it to the main is low, narrow, and cultivated. Fishing vessels lie during the summer in Loch Beg, the creek on the western side, but it is scarcely 200 yards wide.

Loch Torridon is 800 yards wide northeastward of the peninsula.

**Du Sgeir**, a small rock, 5 feet (1.5 m.) high, lies with the northern extremity of Ru Ardheslaig bearing  $82^{\circ}$ , distant 600 yards. A rock awash at low water is situated 250 yards eastward of Du Sgeir and requires caution when working in or out; Rudha na h Airde Glaise

open northeastward of Ru Ardheslaig,  $117^{\circ}$ , leads northeastward of it.

**Ru Ruag**, the northwestern point of the entrance to Loch Torridon is 129 feet (39.3 m.) high and the termination of slightly sloping land; on its southeastern side is a sandy bay, and  $\frac{1}{4}$  mile from it, but connected with the shore by shallow water, is Sgeir Ghlas, a low islet. Close to the shore northeastward of Sgeir Ghlas is a rock named Eilean Tioram.

**Sgeir na Trian**, nearly in the middle of the entrance, and  $1\frac{1}{4}$  miles southward of Ru Ruag, is a small islet 7 feet (2.1 m.) high; shoal water extends 100 yards northeastward of it.

**Rock**.—A rock, on which a depth of  $2\frac{1}{2}$  fathoms (4.6 m.) has been found, but on which there is probably less water, lies with Sgeir na Trian bearing  $335^{\circ}$ , distant 750 yards.

Sgeir na Trian and this rock are on a bank with depths of from 6 to 20 fathoms (11 to 36.6 m.) and from 21 to 32 fathoms (38.4 to 58.5 m.) around.

**The northeastern shore** of the loch trends  $5\frac{1}{2}$  miles southeastward from Ru Ruag to Diabaig Point, and is barren and bleak. Grey Rocks are two islets close together, lying 400 yards offshore 1,300 yards northwestward from Diabaig Point. Diabaig Point, which extends northeastward about  $\frac{3}{4}$  mile into the loch, is peculiarly rugged and rocky, 460 feet (140.2 m.) high, and steep to on its western and southern sides.

**Loch Diabaig**, on the northeastern side of Diabaig Point, is a bay receding about 1,400 yards, and is between 600 and 800 yards wide; it is not a safe place with west to northwest winds, as there is but little shelter, and the water, except in the southern corner, is deep.

The shore from Diabaig Point to Ardglass Point,  $1\frac{1}{2}$  miles southeastward, is rocky and indented. Ardglass Point is the northern shore of the entrance to the Kyle or narrows leading into Upper Loch Torridon.

**Loch Shildaig** ( $57^{\circ} 32' N.$ ,  $5^{\circ} 41' W.$ ), commences between Ru Ardheslaig and Diabaig Point. Dora Rock, which dries 2 feet (0.6 m.), lies 300 yards from the western shore nearly 800 yards southward of the promontory of Ru Ardheslaig. Shildaig Island, from the northern end of which shoals extend 135 yards, is  $\frac{3}{4}$  mile from the head of the loch; between it and the eastern shore is a narrow shallow channel, but a depth of  $1\frac{1}{2}$  fathoms (2.7 m.) can be carried through near the island. Sand dries off 300 yards at low water from the head of the bay, and 400 yards farther off is a rock which dries 8 feet (2.4 m.). Vessels anchor southward of Shildaig Island in from 13 to 10 fathoms (23.8 to 18.3 m.), but the bottom is soft mud through which the anchor easily drags.

Shieltaig village is on the shore southeastward of Shieltaig Island at the foot of Stron Nea, a steep solitary mountain 1,684 feet (512 m.) high.

**Upper Loch Torridon.**—The Kyle, or channel, between Loch Shieltaig and Upper Loch Torridon is 400 yards wide, but the shores are bold. The Upper Loch is surrounded by hills and lofty mountains of varied character, affording fine scenery. Low-water rocks and gravelly spits fringe the northern shore of the loch, especially off the mouths of burns, where the shoals extend 400 yards, outside which the water is generally deep, so there is no good anchorage.

On the southern shore are a number of small bays, and anchorage can be obtained off most of them in a moderate depth of water.

A rock, which dries 6 feet (1.8 m.), lies 1,600 yards southeastward from the eastern point on the southern side of the Kyle and 300 yards from the shore. The best anchorage is near the head of the loch in from 7 to 9 fathoms (12.8 to 16.5 m.) about  $\frac{1}{2}$  mile from the southern shore. There is a pier in the eastern corner of the loch, near a few cottages called Ploc.

The Torridon River flows into the head of the loch, and a flat dries out nearly 800 yards across the head, with shallow water of from 2 feet to  $2\frac{1}{2}$  fathoms (0.6 to 4.6 m.) for another  $\frac{1}{2}$  mile in the southeastern corner.

**Tides.**—It is high water, full and change, at Shieltaig at 6h. 20m.; springs rise 15 feet, neaps 11 feet. The currents in the loch are weak, except in the Kyle, where it runs strongly at half tide. The current runs in during the rising tide, and out during the falling tide.

**Directions.**—From the southward or westward to avoid Murdoch Breac and other rocks off Rudha na Fearna, see page 368.

From the northward, pass  $\frac{3}{4}$  mile southwestward of Sgeir na Trian to avoid the  $2\frac{1}{2}$  fathom (4.6 m.) rock, and then steer southeastward up the loch.

If bound to Loch Creagach, pass westward of Du Sgeir, giving Camus Nose and Sgeir Ghlas a berth of 400 yards and anchor off the cottages in the northwestern corner of the loch.

To proceed to Shieltaig through the narrows between Diabag Point and Ru Ardheslaig, then pass westward of Shieltaig Island, and anchor in about 13 fathoms (23.8 m.), mud, with the inn, which is the southern house of Shieltaig Village, bearing  $70^\circ$ .

When working in, there is plenty of room without closing either shore, and both shores of the first narrows are bold, but caution is necessary when in the vicinity of the rock southward of Sgeir na Trian and the rock between Du Sgeir and Ru Ardheslaig.

**The coast** of the mainland from Ru Ruag trends northeastward  $3\frac{3}{4}$  miles to Sron na Carra (Carr Point) at the entrance to Loch

Gairloch, and is nearly straight; there are no outlying rocks, and the 10-fathom (18.3 m.) curve is from about 400 to 1,800 yards offshore.

**Loch Gairloch.**—The entrance to Loch Gairloch between Sron na Carra and Longa Island to the northward is 1.8 miles wide, and free from shoals except Nares Rock; the loch extends eastward  $3\frac{1}{2}$  miles, and then turns southeastward  $1\frac{1}{2}$  miles; in this latter part there are three anchorages. The loch is generally deep and clear in the outer part, yet it does not afford anchorage a stranger would find easy to take up at night, except temporarily in about 20 fathoms (36.6 m.) when within shelter, for at the anchorages at the head of the loch the water shoals suddenly. There are also several hills on the southeastern side of the bay, similar to each other in appearance and height, which cast a shadow on the water and render it difficult to estimate the distance offshore.

**The southern shore** of the loch from Sron na Carra trends eastward 2 miles to Rudha na Moine, the western entrance point of Badachro Harbor, the only indentation being Port Henderson, a small bay 800 yards eastward of Sron na Carra.

**Nares Rock**, 600 yards  $20^\circ$  from An Sguman, the western entrance point of Port Henderson, is a patch 70 yards in extent within the 5-fathom (9.1 m.) curve, having a least depth of 3 fathoms (5.5 m.); there are depths of 10 fathoms (18.3 m.) close outside the rock, and of 7 to  $5\frac{1}{2}$  fathoms (12.8 to 10.1 m.) for 300 yards from it toward the shore to the southeastward.

**Eilean Horrisdale.**—The shore from Rudha na Moine trends southward about 450 yards, and Eilean Horrisdale lies just over 200 yards eastward of it. The island is 800 yards long north and south, 750 yards wide, and 119 feet (36.3 m.) high. The loch is 1,300 yards wide between the island and Sron na Airde to the eastward.

A rock with less than 6 feet (1.8 m.) water lies 100 yards northward of the northwestern point of Eilean Horrisdale. Shoal water extends 300 yards north-northeastward from about the middle of the north coast of the island, and terminates in a rock with 3 fathoms (5.5 m.) water.

**Badachro Harbor** ( $57^\circ 42' N.$ ,  $5^\circ 43' W.$ ) is a well-sheltered basin less than 200 yards wide between Eilean Horrisdale and the mainland to the westward; it is used as a fish-curing station, and is much frequented by small vessels. There is an entrance both westward and southward of the island, but that to the westward is the only one for a stranger.

A ledge of rocks extends 120 yards from the western shore, 350 yards within the entrance, and a rock, 2 feet (0.6 m.) high, on the eastern end of this ledge, marks the western side of the channel,

about 50 yards wide, with  $3\frac{1}{2}$  fathoms (6.4 m.) water, leading into the harbor.

The anchorage is in 3 fathoms (5.5 m.), mud, about 150 yards southeastward of the rock 2 feet (0.6 m.) high. It is obstructed by a pinnacle rock, with 4 feet (1.2 m.) water, situated 100 yards southward of the rock 2 feet (0.6 m.) high. A vessel 150 feet long has room to swing if tautly moored; small craft can anchor or moor farther up the harbor, southeastward of Sgeir Ghlas, the eastern of two islets on the western side.

Badachro Village, on the southwestern shore of the harbor, has some shops and a postal telegraph office.

**Tidal currents.**—The current in the harbor sets southward during the rising, and northward during the falling tide, at a rate of about  $\frac{1}{2}$  knot, which is affected by the amount of water coming down the river at the head.

**Glas Eilean** is a small islet 24 feet (7.3 m.) high in the middle of the loch, 750 yards northeastward of Eilean Horrisdale. A small rocky shoal, with  $4\frac{1}{2}$  fathoms (8.2 m.) water, lies 120 yards southwestward of the islet.

**Birds Nest Anchorage.**—Two detached low-water rocky ledges front the southeastern side of Eilean Horrisdale at the distance of about 150 yards and together extend 250 yards northeast and southwest. Sgeir Dubh More, the southwestern ledge, is awash at high water, and lies eastward of the southern entrance to Badachro Harbor; a rock with less than 6 feet (1.8 m.) water is situated 50 yards southward of the ledge.

Sgeir Dubh Beg, the northeastern ledge, dries 12 feet (3.7 m.), and foul ground extends 100 yards northeastward from it.

Well Rock, with 1 foot (0.3 m.) water, lies 350 yards east-southeastward of Sgeir Dubh Beg and 150 yards off the shore to the southwestward; shoal water extends 100 yards from the rock.

Birds Nest Anchorage, between Sgeir Dubh Beg and Well Rock, has a depth of 12 fathoms (21.9 m.), mud, with the extremities of Eilean Horrisdale bearing  $265^\circ$  and  $346^\circ$ .

**Shoal.**—A rocky shoal, about 100 yards in extent within the 5-fathom (9.1 m.) curve and with  $2\frac{3}{4}$  fathoms (5 m.) least water, lies 200 yards eastward of Well Rock.

There is a depth of from 16 to 12 fathoms (29.3 to 21.9 m.) in the clear passage between this shoal and Fraoch Eilean, 300 yards to the southeastward.

**Camus na h Airidhe** affords anchorage in 13 fathoms (23.8 m.), mud, about 300 yards westward of the northwestern point of Fraoch Eilean, which is rather less confined than Birds Nest Anchorage.

**Fraoch Eilean** ( $57^\circ 42' N.$ ,  $5^\circ 42' W.$ ) is a small heath-covered island 34 feet (10.4 m.) high,  $\frac{1}{2}$  mile southeastward of Eilean Hor-

risdale; it is bordered by rocks for about 100 yards and rocks dry between it and the shore to the southward.

**Loch Shildaig** extends southward about 1,200 yards with a width of 550 yards from its entrance 350 yards southeastward of Froach Eilean. A rock which dries 1 foot (0.3 m.) lies 60 yards off the eastern entrance point.

There are two islets in the loch; Eilean and Savail, heath covered and 19 feet (5.8 m.) high, is 300 yards inside the entrance and nearly equidistant from either side; Eilean Shildaig 38 feet (11.6 m.) high, covered with low trees and bushes, is not quite 200 yards southward of Eilean ant Savail, and is nearly joined to the southwestern shore at low water. Shoal water extends 70 yards eastward from Eilean ant Savail, and a rock with less than 6 feet (1.8 m.) water lies 75 yards southeastward from the northeastern point of that islet.

The eastern side of the loch is step-to a short distance from the edge of the low-water rocks, and the depths decrease from 14 to 5 fathoms (25.6 to 9.1 m.) in the channel between it and Eilean ant Savail.

**Anchorage.**—There is anchorage in 5 fathoms (9.1 m.), mud, with the northeastern point of Eilean ant Savail bearing  $310^\circ$ , and the northern extremity of Eilean Shildaig  $235^\circ$ , where a vessel 200 feet long can moor with room to swing. Smaller vessels can anchor further up in 3 fathoms (5.5 m.) mud, with the southern extremity of Eilean Shildaig bearing  $240^\circ$ , distant about 150 yards.

**Loch Kerry** is the bight in the southeastern part of the bay, situated eastward of a line between the eastern entrance point to Loch Shildaig and Seana Chreag, 1,300 yards to the northward. Off the loch the water shoals suddenly from about 16 to 6 fathoms (29.3 to 11 m.). The 3-fathom (5.5 m.) curve is 250 yards, and the 5-fathom (9.1 m.) curve 500 yards, from the head of the loch. A rock, with 5 feet (1.5 m.) water, and 2 to 3 fathoms (3.7 to 5.5 m.) around, lies 250 yards eastward of Rudha nan Eanntag, the southwestern entrance point of the loch.

There is anchorage in 5 fathoms (9.1 m.) sand, 300 yards north-northeastward of Rudha nan Eanntag, but a considerable swell sets in during northwesterly gales.

**Flowerdale Bay** is the northeastern part of the above-mentioned bay. The village of Gairloch is situated around its inner part, and Flowerdale House, which is encircled by wood, is about 400 yards up the glen; the post and telegraph office is conspicuous. The anchorage is very confined and the water shoals suddenly from 14 to 6 fathoms (25.6 to 11 m.). When entering give Seana Chreag a berth of 200 yards and anchor in 8 fathoms (14.6 m.) with the northeastern side



of Glas Eilean in range with Seana Chreag, and the southeastern corner of the pier bearing  $50^{\circ}$ . A nasty swell comes in with westerly winds.

There is a good pier, 260 feet in length, alongside the western part of which the steamers from Oban lie in 13 feet (4 m.) at low water; the depth decreases to 6 feet (1.8 m.) toward the middle of the pier, and at the eastern end it is nearly dry.

**Strath Bay**, northward of Sron na Airde, is about  $1\frac{1}{4}$  miles wide but quite open to westerly winds and unsuitable for anchorage. The Seceders Church, near the beach in the northeastern part of the bay, and Gairloch Hotel and Free Church, farther to the southward, are conspicuous.

Strath Gairloch, a village of neat-looking whitewashed houses, stands on the northern shore of Strath Bay.

**Longa Island** ( $57^{\circ} 44' N.$ ,  $5^{\circ} 49' W.$ ), on the northern side of the entrance to Loch Gairloch, is rather more than 1 mile in length east and west, from 300 to 1,000 yards in breadth, and 222 feet (67.7 m.) high; near the western end the island is almost divided by a low isthmus; it is covered with a mixture of grass and heather and is moderately steep all round, except at the eastern point, which is low and dries off to the distance of over 100 yards with depths under 2 fathoms (3.7 m.) 250 yards from it.

Rocky and uneven ground with less than 5 fathoms (9.1 m.) water extends 300 yards off the southern part of the west coast of Longa and 150 yards off its northern part.

**Caolas Beg** (Little Sound), northeastward of Longa Island, is a channel  $\frac{1}{2}$  mile wide, with  $3\frac{1}{4}$  fathoms (5.9 m.) on the deepest part of the bar separating the island from the northeastern shore of the loch; the bar, with from  $1\frac{3}{4}$  to  $3\frac{1}{4}$  fathoms (3.2 to 5.9 m.) at low water, extends off the northeastern end of the island, and shoal water extending off the northeastern shore meets it. Small vessels anchor northward of the island in southerly gales, but should keep ready to proceed through Caolas Beg should the wind veer to the westward.

**Tides and tidal currents.**—It is high water, full and change, at Loch Gairloch at 6h. 20m.; springs rise 14 feet, neaps  $10\frac{1}{3}$  feet; neaps range 6 feet; extraordinary springs rise 17 feet. The tidal currents are weak in the middle of the loch, but attain a rate of from  $\frac{1}{4}$  to  $\frac{1}{2}$  knot toward either shore. In Caolas Beg the current runs southeastward during the rising tide and northwestward during the falling tide, both currents having a rate of 1 knot at springs.

**Directions.**—The chart is a sufficient guide to an anchorage in about 20 fathoms (36.6 m.) water eastward of Eilean Horrisdale by day. At night keep about  $\frac{1}{2}$  mile off the southwestern shore until the eastern point of Eilean Horrisdale bears  $135^{\circ}$ , then steer about

127° to pass 300 yards northeastward of that point and anchor in about 20 fathoms (36.6 m.). The other anchorages are more difficult to enter without local knowledge.

**Supplies, etc.**—Fresh bread can be obtained at Gairloch, and meat either at Strath Gairloch or Badachro. Repairs can not be effected, but small spars and planks may be purchased. There is regular steam communication weekly with Glasgow, Oban, and Kyle of Lochalsh, connecting at the latter place with the steamers for Portree and Stornoway; during the summer the steamers run more frequently.

**The coast** from Rudha Ban, which is 260 feet (79.3 m.) high and 1 mile northward of Longa Island, trends northward  $6\frac{1}{2}$  miles to Rudh' Re, whence it turns abruptly eastward. It is generally bold and rocky, but by no means steep-to, there being not more than 2 fathoms (3.7 m.) at the distance of 400 yards in places. The 10-fathom (18.3 m.) curve is from 1,000 to 1,600 yards offshore, but the soundings generally decrease with great regularity; the shore should be given a berth of 1 mile when navigating along it.

**Rudh' Re** ( $57^{\circ} 51' N.$ ,  $5^{\circ} 49' W.$ ) is a prominent headland, which rises to the height of 964 feet (293.8 m.) 2 miles southeastward and has a flat outline. Its western coast is cliffy, with here and there a few sandstone cliffs and steep braes. A rock lies 100 yards north-westward of the point, and there are depths of from 8 to 10 fathoms (14.6 to 18.3 m.) close outside it.

**Light.**—A group flashing white light, 120 feet (36.6 m.) above water, visible 17 miles, is shown from a white tower, 83 feet (25.3 m.) above water, on the northwestern extremity of Rudh' Re. The lighthouse is connected by telephone with the post office at North Erradale.

**Fog signal.**—A siren is sounded at the lighthouse. See Light List.

**Tidal currents.**—Off the coast southward of Rudh' Re the currents are weak. Off Rudh' Re the current runs north-northeastward at a rate of 3 knots at springs from  $3\frac{1}{2}$  hours before until  $2\frac{3}{4}$  hours after high water and westward from  $2\frac{3}{4}$  hours after high water until  $3\frac{1}{2}$  hours before the next high water at a similar rate, but 2 miles off the point the currents are not much felt.

**The coast** from Rudh' Re northward to Cape Wrath is described in H. O. Publication No. 148.

# APPENDIX I

*List of the principal ports and anchorages, with depths*

Port	Depth below chart datum level		Rise of tide		Remarks
	In channel of approach	In anchorage	Springs	Neaps	
			<i>Feet</i>	<i>Feet</i>	
Ardrishaig.....	3 to 10 fathoms.....	2½ to 4½ fathoms.....	9.2	8.6	
Ardrossan.....	10 to 18 feet.....	20 to 30 feet.....	10.0	7.9	
Arisaig.....	7 feet.....	12 to 18 feet.....	13.5	10.0	
Ayr.....	15 feet.....	16 feet.....	10.0	8.5	
Ballachulish Bay.....	10 fathoms.....	10 fathoms.....	12.3	8.6	
Broadford Bay.....	Deep.....	6 to 12 fathoms.....	15.5	11.0	
Brodick Bay.....	do.....	11 to 17 fathoms.....	9.5	7.0	
Caol More.....	do.....	7 to 13 fathoms.....	16.5	11.0	
(Raasay Island)					
Campbeltown.....	8 fathoms.....	7 to 9 fathoms.....	8.8	6.0	
Canna Harbor.....	Deep.....	12 feet.....	14.7	10.2	
Carradale Bay.....	do.....	5 to 7 fathoms.....	9.0	6.0	
Corran Narrows.....	8 fathoms.....	7 to 9 fathoms.....	12.3	8.6	
East Loch Tarbert.....	16 feet.....	15 to 30 feet.....	9.0		No anchorage.
Glasgow.....	24 to 26 feet.....		13.3	10.7	
Gourock Bay.....	Deep.....	9 to 12 fathoms.....	10.3	8.4	
Greenock.....	26.5 feet.....		10.3	8.4	See Tail of the Bank.
Fort William.....	Deep.....	4 to 8 fathoms.....	12.0	8.2	
Irvine.....	7 feet.....	8 to 12 fathoms.....	9.0	6.5	
Isle Ornsay Harbor.....	12 fathoms.....	7 fathoms.....	14.8	10.5	
Kyle Akin.....	6 to 8 fathoms.....	3½ to 7 fathoms.....	15.5	11.0	
Kyles of Bute.....	18 feet.....	36 to 42 feet.....	10.0	8.2	
Kyle Rhea.....	5 to 10 fathoms.....	11 fathoms.....	15.5	11.0	
Lamlash (north entrance).....	6 fathoms.....	10 to 17 fathoms.....	10.0	7.0	
Lamlash (south entrance).....	15 fathoms.....				
Lochaline.....	6 feet.....	48 to 60 feet.....	13.8	10.5	
Loch Aber.....	4 to 11 fathoms.....	4 to 14 fathoms.....	12.0	8.2	To Corpach.
Loch Carron.....	5½ fathoms.....	2 to 6 fathoms.....	16.5	11.5	Off Plockton.
Loch Corrie.....	Deep.....	7 fathoms.....			
Loch Craignish.....	6 fathoms.....	6 to 7 fathoms.....	6.0	4.0	
Loch Crenan.....	2½ to 3 fathoms.....	5 to 7 fathoms.....			
Loch Crinan.....	4 fathoms.....	2½ to 4 fathoms.....	6.1	3.9	
Loch Etive.....	3 fathoms.....	5 fathoms.....	10.0		
Loch Gair.....	15 feet.....	12 to 18 feet.....	9.0	6.0	
Loch Gairloch.....	Deep.....	11 to 20 fathoms.....	14.0	10.3	
Loch Gilp.....	do.....	3 to 4½ fathoms.....	9.0		
Loch Indail.....	6 fathoms.....	3 to 4 fathoms.....			
Loch Keills.....	7 fathoms.....	5 fathoms.....			
Loch Kishorn.....	Deep.....	8 to 12 fathoms.....	16.5	11.5	
Loch Leven.....	1½ fathoms.....		12.8	8.6	In Narrows.
Loch Melford.....	Deep.....	6 fathoms.....			
Loch Mildart.....	6 fathoms.....	3½ to 5 fathoms.....	13.9	9.7	
Loch Na Droma.....	4 fathoms.....	10 fathoms.....	13.5		
Buidhe.....					
Loch Na Keal (Mull).....	Deep.....	7 fathoms.....	13.0	8.0	
Loch Nevis.....	7 to 12 fathoms.....	10 fathoms.....	15.4	10.6	In Invarie Bay.
Loch Nevis Narrows.....	13.5 feet.....	30 to 40 feet.....	15.4	10.6	
Loch Ranza.....	Deep.....	5 to 8 fathoms.....	10.0	7.0	
Loch Ryan.....	21 to 30 feet.....	30 to 40 feet.....	9.5	7.5	
Loch Scridan.....	10 fathoms.....	7 to 10 fathoms.....	14.5	11.0	
Loch Sligachan.....	16 feet.....	4 to 10 fathoms.....	15.0	10.0	
Loch Spelve.....	2 fathoms.....	6 fathoms.....	10.0	7.0	
Loch Sunart.....	2½ to 3 fathoms.....	5 fathoms.....	13.5		In Laudale Narrows.
Loch Tarbert (Jura).....	12 fathoms.....	6 to 7 fathoms.....			In Glenpatrick Bay.
Loch Torridon.....	11 fathoms.....	6 to 13 fathoms.....	15.0	11.0	
Lowlandman Bay.....	5 fathoms.....	3 to 4½ fathoms.....	3.5	2.2	

*List of the principal ports and anchorages, with depths—Continued*

Port	Depth below chart datum level		Rise of tide		Remarks
	In channel of approach	In anchorage	Springs	Neaps	
(Raasay Island)—Con.			<i>Feet</i>	<i>Feet</i>	
Maillag Harbor.....	Deep.....	4 to 5 fathoms.....	14.8	10.5	
Millport Bay.....	2 fathoms.....	2½ fathoms.....	10.0	8.0	
Oban (north channel)...	8 fathoms.....				
Oban (south channel)...	6 to 7 fathoms.....	8 to 23 fathoms.....	11.2	8.2	
Portree.....	10 fathoms.....	2 to 12 fathoms.....	15.0	10.8	
Port Ellen.....	6 fathoms.....	3½ to 6 fathoms.....	5.0	4.0	
Port Glasgow.....	26.5 feet.....		11.2	9.3	
Port Patrick.....	6 to 8 feet.....	9 feet.....	15.0	12.0	
Rothsay Bay.....	Deep.....	8 to 10 fathoms.....	10.5	9.0	
Stranraer.....	6 to 13 feet.....	13 feet.....	9.5	7.5	
Tail of the Bank.....	Deep.....	10 to 15 fathoms.....	10.3	8.4	
Tobermory.....	do.....	14 to 16 fathoms.....	13.9	10.7	
Troon.....	16 feet.....	7 to 19 feet.....	9.1	6.7	
West Loch Tarbert.....	5 fathoms.....	5 fathoms.....	4.0	-----	Off Argylls Mound

## APPENDIX II

Particulars of dry docks, marine railways, etc.

Name of port and dock	Length from bilge of caisson or miter post of gates at—		Breadth of entrance at—		Distance (below (+), above (—)) chart datum level of—			Springs rise	Floating docks, patent slips, etc.			Remarks
	Coping head	Floor head	Coping	M. H. W. S. level	Sill	Blocks, at—			Maximum depth over blocks		Lifting power	
						Entrance	Head					
Ardrossan: Dry dock Marine railway	Feet 310.0 145.0	Feet 310.0	Feet 38.0 28.5	Feet 38.0	Feet +3.8	Feet +3.8	Feet +3.2	Feet 10.0	Feet 4.6	Feet 10.6	Tons 420	Will take vessels up to 140 feet.
Ayr: Marine railway	260.0								9.8	14.0	1,600	
Glasgow: Clyde Trustees.—No. 1 Dry Dock Clyde Trustees.—No. 2 Dry Dock	571.0 577.5 607.5	551.0 575.0 605.0	72.0 67.0 With caisson in outer stop.	69.5 64.0	+10.6 +10.6	+8.5 +8.9	+7.4 +8.9	13.3 13.3				
Clyde Trustees.—No. 3 Dry Dock	880.0 911.0	880.0 911.0	83.0 With caisson in outer stop.	83.0	+14.2 +14.7	+13.0 +13.0	+13.0 +13.0	13.3				
Patrick—D. & W. Henderson Elderslie Graving Dock Pointhouse marine railway (A. & J. Ingles (Ltd.)) Patrick marine railway (D. & W. Henderson) Dalnair marine railway (W. Beardmore & Co.) Bowling marine railway No. 1 (Scott & Sons)	500.0 524.7 222.0 213.0 200.0 190.0 150.0	474.0 519.6	54.7 68.0	53.3 66.9	+5.7 +8.4	+2.3 +7.1	+1.1 +7.1	13.3 13.3	10.0 9.0 6.5 6.0 6.0	15.0 16.7 17.5 13.0 12.0	1,500 1,000 900 700 500	
Gourock: J. Adam & Son—marine railway Marine railway	80.0 40.0		16.0 12.0						10.0 9.0	11.2 10.2	100 50	



## APPENDIX III

## METEOROLOGICAL TABLES

[From the British Admiralty Sailing Directions]

Colmonell. Obs.  $\Delta$  latitude  $55^{\circ} 08' N.$ , longitude  $4^{\circ} 58' W.$  Height above mean sea level, 171 feet (52.1 m.). Meteorological table compiled from 9 to 45 years' observations, 1871-1920

Month	Barometer. At 32° F. mean sea level and latitude 45°				Air temperature								Relative humidity †		Rain		Wind ‡							Number of days gales †	Number of hours logs †			
	Mean		Extreme		For month		Mean daily		Mean monthly		Ex- treme		Total fall		Number of days		Maximum fall in 24 hours ‡		Percentage of observations from—									
	Daily range		Range				Maximum		Minimum		Maximum		Minimum															
	Ins.	Obs.	Ins.	Obs.	° F.	° C.	° F.	° C.	° F.	° C.	° F.	° C.	° F.	° C.	° F.	° C.	° F.	° C.	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	
January	29.89	39.43	34.52	22.55	13	89	7.2	4.33	Ins.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
February	29.86	39.44	34.52	24.55	12	89	6.2	3.86	1.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
March	29.86	41.47	35.56	23.61	16	85	6.4	3.39	1.38	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
April	29.89	45.52	37.63	26.70	16	82	6.4	2.52	1.87	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
May	29.98	50.58	42.74	31.82	26	81	6.6	2.52	1.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June	29.98	55.62	47.73	38.69	33	80	6.6	2.52	1.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
July	29.92	57.64	49.74	40.82	36	83	6.7	3.15	1.78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
August	29.89	56.63	49.74	40.88	34	85	7.0	4.02	1.34	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
September	29.83	54.60	47.63	38.76	28	88	6.5	3.46	1.83	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
October	29.86	48.55	42.56	38.74	22	89	6.5	4.45	2.01	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
November	29.86	43.49	38.59	23.59	12	89	6.9	5.00	1.22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
December	29.80	40.45	35.53	22.57	15	89	7.0	5.59	1.97	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mean	29.89	47.53	41.78	31.7	---	---	6.7	44.84	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Extreme value	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Number of years' observations	45	35	---	---	---	13	---	35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9	27

¹ Reduced to 45 years, mean of 7 h.

² At 9 h.

³ Maximum fall during any consecutive 24 hours, from one morning observation to the next.

† Observations at Corsewall.

‡ Mean of highest each year and lowest each year.

# APPENDIX

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Month	Barometer. At 32° F. mean sea level and latitude 45°				Air temperature								Relative humidity				Cloud amount, scale 0 to 10		Rain			Wind								Number of days, fogs.		Number of days, gales.	
	Mean		Extreme		For month		Mean daily		Mean monthly		Extreme		Relative humidity				Total fall		Number of days <sup>1</sup>		Maximum fall in 24 hours		Mean velocity miles per hour		Frequency in per cent								
	For month	Daily range	Maximum	Minimum	Range	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Total fall	Number of days <sup>1</sup>	Maximum fall in 24 hours	Mean velocity miles per hour	Frequency in per cent												
																					North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm				
January	Ins.	Ins.	Ins.	Ins.	Ins.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	Ins.	20	1.53	12.8	4	8	11	5	6	11	26	17	4	13	3		
February	29.89	31.12	27.46	31.04	28.32	3.66	39	42	35	50	54	55	8	85	8	83	3.62	17	2.72	12.5	5	11	11	5	10	22	17	5	14	1	1		
March	29.89	31.04	28.32	30.79	28.32	2.46	39	43	35	51	56	7	88	7	86	3.03	18	1.10	12.8	5	12	12	4	7	16	19	5	11	0.3	0.4			
April	29.86	30.89	28.32	30.74	28.17	2.52	40	45	36	55	56	19	80	7	77	2.69	15	1.30	12.0	5	15	12	4	8	20	19	5	12	0.1	0			
May	29.92	30.74	28.17	30.74	28.17	2.57	41	46	37	61	61	21	76	7	74	2.64	16	1.42	11.5	4	16	19	3	6	17	23	5	13	0.1	0			
June	29.98	30.80	28.73	30.68	28.03	2.65	49	57	43	68	68	29	75	7	72	2.66	15	1.36	10.6	3	14	16	3	6	17	23	3	9	0.1	0			
July	29.98	30.62	28.97	30.62	28.03	2.65	49	57	43	68	68	29	75	7	72	2.66	15	1.36	10.6	3	14	16	3	6	17	23	3	9	0.1	0			
August	29.92	30.62	28.97	30.62	28.03	2.65	49	57	43	68	68	29	75	7	72	2.66	15	1.36	10.6	3	14	16	3	6	17	23	3	9	0.1	0			
September	29.89	30.56	28.73	30.56	28.73	1.83	57	63	51	73	43	85	41	78	8	3.07	18	2.52	10.1	3	11	10	3	7	21	26	5	15	0.1	0			
October	29.95	30.59	28.73	30.59	28.73	1.86	53	59	48	67	53	83	31	84	8	3.23	17	1.81	10.2	4	10	12	3	7	21	20	5	17	0.3	1			
November	29.86	30.77	28.29	30.77	28.29	2.48	47	52	42	61	51	24	84	8	3.74	19	1.69	10.9	4	12	12	5	9	20	17	5	18	0.7	4				
December	29.80	30.77	28.14	30.77	28.14	2.63	42	46	38	55	27	86	8	3.06	8	4.13	21	1.88	11.9	4	12	13	4	8	20	19	5	15	1	9			
Mean	29.89	30.92	27.70	30.92	27.70	3.22	47	52	42	78	52	56	81	8	38.27	212	2.72	11.4	4	12	13	4	8	20	19	5	15	6	9				
Total	29.89	30.92	27.70	30.92	27.70	3.22	47	52	42	78	52	56	81	8	38.27	212	2.72	11.4	4	12	13	4	8	20	19	5	15	6	9				
Extreme value	31.12	27.46	3.66	31.12	27.46	3.66	52	50	54	54	38.27	212	2.72	11.4	4	12	13	4	8	20	19	5	15	6	9								
Number of years' observations.	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50			

<sup>1</sup> Mean of highest each year and lowest each year.

<sup>1</sup> Day with fall 0.004 in. or more.

Observations reduced to mean of 24 hours.



Fort William. Obs.  $\Delta$  latitude  $56^{\circ} 49' N.$ , longitude  $5^{\circ} 07' W.$  Height above mean sea level, 171 feet. Meteorological table compiled from 14 to 45 years' observations, 1871-1920

Month	Pressure. At mean sea level, reduced to 32° F. and latitude 45°.		Air temperature						Relative humidity †		Cloud amount, scale 0 to 10 ‡	Rain		Wind										Number of days gales	Number of days fogs		
	For month	Mean	Extreme		Mean monthly		Ex- treme	Relative humidity †		Total fall		Number of days	Maximum fall in 24 hours ‡	Mean force Beaufort scale	Percentage of observations from—												
			Maximum	Minimum	Maximum	Minimum		North	Northeast						East	Southeast	South	Southwest	West	Northwest	Calm						
January.....	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	1	9	7	4	5	39	15	2	18	0.8				
February.....	20.83	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	2	18	6	3	4	43	11	3	23	0.7				
March.....	20.86	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	2	18	6	3	4	32	9	3	23	0.3				
April.....	20.80	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	20	5	2	4	33	10	3	22	0.1				
May.....	20.92	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	18	4	4	4	31	11	2	26	0.1				
June.....	20.89	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	1	18	4	2	2	29	14	5	25	0.1				
July.....	30.00	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	1	18	4	1	2	30	12	3	33	0.4				
August.....	20.92	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	15	4	1	2	30	12	3	33	0.2				
September.....	20.89	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	1	10	5	2	4	32	11	3	32	0.4				
October.....	20.95	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	12	7	5	5	29	7	2	33	0.6				
November.....	20.86	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	12	10	2	3	38	8	1	26	0.9				
December.....	20.83	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	0	11	8	3	5	40	10	1	22	0.8				
Means.....	20.86	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	1	14	6	2	3	34	11	3	26	5.0				
Totals.....																											
Extreme Values.....																											
No. of Years' Observations.....	32																										
												35															14

<sup>1</sup> Mean of 24 hours.

<sup>2</sup> Maximum fall during any consecutive 24 hours, from one morning observation to the next.

<sup>3</sup> Mean of highest each year and lowest each year.

<sup>4</sup> Mean of observations at 9 hours and 21 hours.

## APPENDIX IV

The following is reproduced from the British Admiralty for the information of mariners:

### CAUTION WHEN APPROACHING BRITISH PORTS

#### PART I.—CLOSING OF PORTS

(1) My Lords Commissioners of the Admiralty having taken into consideration the fact that it may be necessary to forbid all entrance to certain ports of the Empire, this is to give notice that on approaching the shores of the United Kingdom, or any of the ports or localities of the British Empire, a sharp lookout should be kept for the signals described in the following paragraph, and for the vessels mentioned in paragraph (5), Part II, of this notice, and the distinguishing and other signals made by them. In the event of such signals being displayed the port or locality should be approached with great caution, as it may be apprehended that obstructions may exist.

(2) If entrance to a port is prohibited, three red vertical lights by night or three red vertical balls by day will be exhibited in some conspicuous position in or near to its approach, which signals will also be shown by the vessels indicated in paragraph (5), Part II, of this notice.

If these signals are displayed, vessels must approach the port with the greatest caution and implicitly obey all orders or signals given them by the examination vessel or signal station.

(3) At some ports or localities at home or abroad searchlights are occasionally exhibited for exercise. Instructions have been given to avoid directing movable searchlights during practice on to vessels under way, but mariners are warned that great care should be taken to keep a sharp lookout for the signals indicated in paragraph (2) above, when searchlights are observed to be working.

#### PART II.—EXAMINATION SERVICE

(4) Under certain circumstances it is also necessary to take special measures to examine vessels desiring to enter the ports or localities at home or abroad.

(5) In such case, vessels carrying the distinguishing flags or lights mentioned in paragraph (7) will be charged with the duty of examining ships which desire to enter the ports and of allotting positions in which they shall anchor. If government vessels, or vessels belonging to the local port authority, are found patrolling in the offing, merchant vessels are advised to communicate with such vessels with a view to obtaining information as to the course on which they

should approach the port. Such communication will not be necessary in cases where the pilot on board has already received this information from the local authorities.

(6) As the institution of the examination service will probably be unknown to vessels desiring to enter the port, especial care should be taken in approaching the ports, by day or night, to keep a sharp lookout for any vessel carrying the flags or lights mentioned in paragraph (7), and to be ready to "bring to" at once when hailed by her or warned by the firing of a gun or sound rocket.

In approaching by night any British port in the United Kingdom or abroad, serious delay and risk will be avoided if four efficient all-round lanterns, two red and two white, are kept available for use.

(7) By day the distinguishing flag of the examination steamer will be a special flag (white and red horizontal surrounded by a blue border).

Also, three red vertical balls if the port is closed.

Usually the examination steamers will fly the blue ensign, but at certain ports they will fly the white ensign.

By night the steamer will carry: (a) Three red vertical lights if the port is closed; (b) three white vertical lights if the port is open.

The above lights will be carried in addition to the ordinary navigation lights, and will show an unbroken light around the horizon.

(8) Masters are warned that when approaching a British port where the examination service is in force they must have the signal letters of their vessel ready to hoist immediately the examination steamer makes the signal: "What ship is that?"

(9) Masters are warned that before attempting to enter any of these ports when the examination service is in force they must in their own interests strictly obey all instructions as to entry given to them by the examination steamer.

Whilst at anchor in the examination anchorage, masters are warned that it is forbidden, except for the purpose of avoiding accident, to do any of the following things without permission from the examination officer: (a) To lower any boat; (b) to communicate with the shore or other ships; (c) to move the ship; (d) to work cables; (e) to allow any person or thing to leave the ship.

(10) In case of fog, masters of vessels are enjoined to use the utmost care, and the port should be approached with caution.

(11) When the examination service is in force merchant vessels when approaching ports are especially cautioned against making use of private signals of any description, either by day or night; the use of them will render a vessel liable to be fired on.

(12) The pilots attached to the ports will be acquainted with the regulations to be followed.

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